

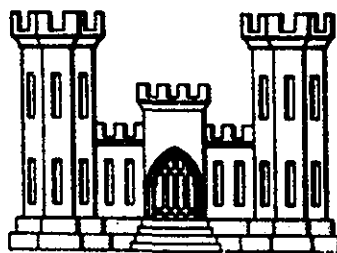
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CONNECTICUT RIVER FLOOD CONTROL

NORTH SPRINGFIELD DAM & RESERVOIR

BLACK RIVER, VERMONT

DESIGN MEMORANDUM NO. 9 MASTER PLAN FOR RESERVOIR DEVELOPMENT



U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS WALTHAM, MASS.

ENGINEERING DIVISION WORKING COPY
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MAY 1961

ENGW-OM (10 May 61)

1st Ind

SUBJECT: North Springfield Dam and Reservoir, Connecticut River Basin,
Vermont - Master Plan for Reservoir Development

Office, Chief of Engineers, Washington 25, D. C., 15 June 1961

TO: Division Engineer, U. S. Army Engineer Division, New England
Waltham, Massachusetts

1. The Master Plan for North Springfield Reservoir is approved
subject to the following comments.

2. In order for the Master Plan to adequately serve the needs for
long range management of lands the Land Allocation map should be modified
to clearly define by appropriate symbol or color each of the following:

a. Lands which are needed over the life of the project for
(1) operation and (2) public recreation. Recreational areas as now shown
on Plates 3 and 4 are not so refined to depict lands from the standpoint
of location by acreage.

b. Lands which are chiefly valuable for fish and wildlife
management.

3. The use of lands by the Vermont Army National Guard as described
in par. 19, page 13 is satisfactory provided such use is not incompatible
with other uses and meets with the approval of other cooperating State
agencies.

FOR THE CHIEF OF ENGINEERS:

1 Incl n/c
(3 cys w/d)

MARK S. GURNEE
Chief, Operations Division
Civil Works

U. S. ARMY ENGINEER DIVISION, NEW ENGLAND

CORPS OF ENGINEERS

424 TRAPELO ROAD
WALTHAM 54, MASS.

ADDRESS REPLY TO:
DIVISION ENGINEER

REFER TO FILE NO.
NEDGW

10 May 1961

SUBJECT: North Springfield Dam and Reservoir
Connecticut River Basin, Vermont -
Master Plan for Reservoir Development

TO: Chief of Engineers
Department of the Army
Washington 25, D. C.
ATTENTION: ENGCGW-0

1. Submitted for review and approval are four (4) copies of Design Memorandum No. 9 - Master Plan for Reservoir Development together with a copy of this letter bound in each copy of the memorandum, in accordance with EM 1110-2-1150.

2. The plan has been developed to provide maximum use of the reservoir by the public consistent with the resources in the area and the authorized flood control operation of the project.

3. No additional land is required.

4. Adequate funds are contained in approved project estimate.

5. Early approval is requested as a basis for initiation of construction this spring.

FOR THE DIVISION ENGINEER:



Incls (quad)
Design Memorandum No. 9
Master Plan for Reservoir
Development, North
Springfield Reservoir, Vermont

KARL F. EKLUND
Colonel, Corps of Engineers
Deputy Division Engineer

FOREWORD

The completion of the North Springfield Flood Control Reservoir on the Black River in southeastern Vermont will supplement existing park recreational opportunities in a region where public water areas are scarce.

Within a forty-mile radius of the project in Vermont, there are three developed National Forest Areas, eleven State Forests and seven State parks. None of these provide facilities for boating and only three have water areas for swimming.

The 110 acre permanent pool retained behind the North Springfield Dam on the Black River and the beautiful 65 acre lake created in conjunction with a highway relocation on the North Branch River are important additions to the few existing public recreational areas containing water bodies in this vicinity.

The Black River, known by the early Indians as "Kas-hact-cha-wak", is a scenic stream in a valley of historic significance.

* In addition to the resident population within the immediate zone of influence of the project, the highly populous northeast section of the country uses this general region intensively for summer vacations, and in constantly increasing numbers, for winter sports.

This Master Plan has been developed from a study of the recreational requirements of the region and recreation, conservation, and wildlife potentialities of the reservoir area.

The views of other interested Federal, State and local agencies have been carefully considered.

The Master Plan proposes basic initial development by Federal funds to the extent necessary for public access, parking and sanitation and minimum facilities which will enable the public to enjoy the recreational resources. The approved project estimate contains funds adequate for accomplishing the proposed development.

It is contemplated that subsequent development and management would be by appropriate agencies of the State of Vermont under license agreement.

Interim management and maintenance of the reservoir area for public use will be performed by this office subject to the availability of funds for this purpose.

BIBLIOGRAPHY OF DESIGN MEMORANDUMS

NORTH SPRINGFIELD RESERVOIR

<u>Design Memo No.</u>	<u>Title</u>	<u>Submission Date</u>	<u>Approved</u>
1	Hydrology	18 Jan 57	28 Feb 57
2	General Design	18 Jan 57	28 Feb 57
3	Earthwork - Stage I	24 Apr 57	
4	Supplement to Design Memorandum No. 2 - General	1 Jul 57	17 Sept 57
5	Equipment in Intake Structure	17 Nov 57	16 Dec 57
6	Relocations	Sept 57	7 Nov 57
7	Real Estate - Part I Real Estate - Part II	6 Dec 56 29 May 57	18 Jan 57 20 Aug 57
8	Relocation Town Road No. 22	10 Dec 58	26 Jan 59
9	Master Plan for Reservoir Development	May 1961	

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I. INTRODUCTION

1. Authorization. The North Springfield Dam and Reservoir is a unit of the comprehensive plan for flood control in the Connecticut River Basin. Authorization of the plan is contained in the Flood Control Act of 1938 (Public Law 761-75th Congress - 3rd Session) as modified by the Flood Control Act of 1941 (Public Law 228 - 77th Congress, 1st Session) and the Flood Control Act of 1944 (Public Law 534 - 78th Congress, 2nd Session). Construction of the project was initiated in June 1957 with completion scheduled for June 1961.

Authorization for development and use of reservoir areas for public recreational and other purposes is contained in Section 4 of the Flood Control Act, approved 22 December 1944 (Public Law 534 - 78th Congress, 2nd Session), as amended.

This Master Plan for reservoir development has been prepared in accordance with EM 1130-2-302, Planning and Administration of Project Lands and Waters, and related manuals.

2. Purpose and Scope. The purpose of this master plan is to present a comprehensive and coordinated program for the development, management and use of the North Springfield Flood Control Reservoir Area for public purposes which are not incompatible with the authorized project purpose. This plan will serve as a guide in the operation and control of land and water use for the derivation of maximum public benefits from the resources of the project. It is intended that this plan will be flexible so that adjustments may be made to it as any changing conditions may warrant.

The scope of this plan includes an evaluation of the public recreational potential of the reservoir area in relation to other recreational opportunities available to the public within the area on which the project may be expected to exert influence.

The development and subsequent operation required to carry out the program has not been considered solely a Federal responsibility but rather a partnership with State and local agencies in providing for public enjoyment of the recreational resources of the project.

3. Cooperative Planning. The following agencies participated in studies leading to the recommended master plan:

Vermont Water Conservation Board
Vermont Fish and Game Service
Vermont Department of Forests and Parks
U. S. Fish and Wildlife Service
National Park Service
U. S. Public Health Service

In addition, a public meeting, sponsored by the Vermont Water Conservation Board, was held in February 1960 at Springfield, Vermont at which the views of the general public regarding recreational uses of the reservoir area were received.

The recommendations of the State of Vermont, submitted by the Water Conservation Board with the approval of the Governor, are included in Appendix B.

These interests concur in this master plan, as submitted.

II. DESCRIPTION OF AUTHORIZED PROJECT

4. Location. The North Springfield Flood Control Dam is located on the Black River in the township of Springfield, Windsor County, Vermont. It is in the southeastern part of the State, about 8.6 miles upstream of the confluence of the Connecticut and Black Rivers and about 3 miles northwest of the town of Springfield, Vermont

5. Pertinent Data. The dam is a rolled earth and rock fill structure 2940 feet in length with a maximum height of 120 feet above the stream bed. The top of the dam is at elevation 570 feet m.s.l. It has a side channel spillway with a crest length of 384 feet at elevation 545 feet m.s.l.

The outlet works include a 12.75 foot horseshoe shaped reinforced concrete conduit 659 feet long, (including transition). Three vertical lift gates, each 5' by 12' are operated from a combined tower intake and gate structure with control rooms and access bridge. The intake channel is about 735 feet long with a bottom width of 20 feet.

The capacity of the reservoir at spillway crest is 50,600 acre-feet which is the equivalent of a runoff of 6 inches from the net drainage area of 158 square miles at the North Springfield Dam site. When filled to spillway crest the reservoir is about 5.4 miles long with a surface area of about 1260 acres.

A permanent pool with a surface area of about 110 acres at elevation 467 m.s.l. has been provided for the protection of the gates during the winter. This pool has a maximum depth of about 17 feet at the dam. The control structure includes a concrete weir constructed around the center gate.

The North Springfield Reservoir will be operated primarily to desynchronize flood flows of the Black River from flows on the Connecticut River. Flow from the reservoir will be reduced whenever

forecasts indicate the channel capacity of the Connecticut River would be exceeded. The operation of this reservoir will be coordinated with other reservoirs in the Connecticut River Basin to obtain the maximum reduction in overall flood damages.

The cost of the project is estimated at \$6,580,000.

6. Description of Reservoir Area. Reservoir land required for the project is estimated at 1,570 acres, of which about 1,352 acres are in fee simple with flowage easement on the remainder.

About half of the reservoir is in open fields which were formerly used for agricultural and pasture purposes. Some 15 percent of the area is marsh. The rest of the area, including the steep sided slopes, is in woodland.

The topography of the area is characterized by hilly land with considerable relief; elevations within the immediate vicinity of the reservoir range from 450 feet, m.s.l. at the dam site to about 1000 feet, m.s.l. at the top of bordering hills and ridges.

The river valley width varies from one half mile to two miles with steep bordering slopes.

Forest cover in the reservoir consists of mixed deciduous and coniferous trees and shrubs.

The underlying base rock foundations in the area are of Paleozoic origin. Outcrops of granite gneiss are present in the vicinity of the dam. Surface geology in the basin is composed of varying thicknesses of glacial till. The reservoir area has soils of the Charlton, Colrain, and Cabot associations.

The Black River flows through the reservoir in a generally southeasterly direction to its confluence with the Connecticut River. The largest tributary to the main stream is the North Branch River which joins the Black River in the town of Wethersfield within the reservoir area.

The Black River flows through the reservoir with an average slope of 26 feet to the mile.

7. Climate. The average temperatures for January and July in the vicinity of the project are 18.5 degrees F. and 68.1 degrees F. respectively. Extreme temperatures have been 102 degrees F. and minus 42 degrees F. Length of the average frost free period is about 112 days.

Precipitation for the year averages about 41 inches and is well distributed among the seasons with a maximum of 52 inches and a minimum of 29 inches being recorded over a 53 year period. The average annual snowfall is about 81 inches between the months of November and April.

Prevailing winds are from the northeast in the winter and from the south in the summer.

III. PROJECT RESOURCES

8. Suitability of Reservoir Area for Recreational use. The North Springfield Reservoir is a single-purpose flood control reservoir and, in accomplishment of its objective, may impound floodwaters to a maximum depth of 95 feet at the dam. Although it is recognized that a flood may occur at any time of the year in the precipitous river basins of New England, the major use of the reservoir will be in the spring of the year with release of the impounded floodwaters occurring as rapidly as downstream conditions and channel capacities permit. Experience over the past twenty years in the operation of other flood control reservoirs in New England indicates that the natural resources of the reservoirs are available for uninterrupted use during most of the summer, fall, and winter seasons. Experience has further shown that the important benefits accruing from public recreational development and use, fish and game and forestry management, and other uses have proven quite compatible with the authorized flood control purpose of these reservoirs. It is, therefore, concluded that the project is suitable for the development and use as proposed in the master plan.

The permanent pool of about 110 acres with a shoreline of about 4 miles which is maintained behind the dam and the 65 acre lake with a shoreline of almost two miles, which was created in conjunction with the required relocation of Town Road No. 22, will be highly attractive to the visiting public.

The scarcity of water areas in public ownership in this vicinity further enhances the value of these resources in an area where aquatic related activities find the most favor with the general public.

The land and water areas of the reservoir are suitable for swimming, fishing, hunting, boating, picnicking, hiking and nature study.

The Black River Valley in the vicinity of the project is quite scenic. The project is readily accessible over a good highway system.

9. Fish and Wildlife Resources. Hunting and fishing are active sports in the Black River Basin. Local and out-of-state anglers utilize this readily accessible scenic section of the river in the reservoir which provides fair to good fishing. Trout fishing is active in the spring before stream temperatures tend to rise. Both rainbow and brown trout are caught from this reach of the stream. Brook trout are also taken, mainly near the mouths of tributary streams.

North Branch River supports particularly good trout fishing both within and above the reservoir site. Brown, rainbow and brook trout are caught in North Branch waters. Approximately 2 miles of the Black River and seven-tenths of a mile of the North Branch River have been inundated by permanent pools. The damage suffered to the trout fishing by the permanent pool on the Black River is compensated by the benefit of the North Branch Lake. Some fish losses will result from the periodic and temporary flooding of the Black River and North Branch River due to operation of the reservoir, but this will reduce scouring action, thus providing a substantial benefit to the downstream fishery resource.

The project will cause a change in habitat conditions in the reservoir area and for some seven miles downstream which will result in warmer waters more favorable to fish species less demanding than trout. This area should be well suited to small-mouth bass.

The white-tailed deer are the principal big game species using lands within and near the reservoir site. Good deer utilization of most of the project lands occurs, particularly near edge associations of woodlands with cleared areas. A few black bears inhabit the general vicinity and at times utilize the project site. In addition to deer and bears, occasionally a "wild boar" is seen in the area.

Grouse, grey squirrels and woodcock are the main upland-game species of the reservoir. The site also provides habitat for both cottontail rabbits and snowshoe hares. Woodland and brush areas are important cover types for the grouse, squirrels and hares; while the bottomland brush cover is used by woodcocks, with the exception of open water, cottontail rabbits inhabit all the various vegetative types in the site. Moderate populations of muskrats; raccoons and red foxes and a few minks and otters may be found within the site at times. Several active beaver colonies are present within the upper limits of the area. Occasionally "bank" beaver frequent the Black River just above the dam site.

Waterfowl habitat, which has been poor, is expected to pick up with the creation of the permanent pool at the dam on the Black River and North Branch Lake on the North Branch River. Opportunity also exists for the creation of shallow marsh areas within the reservoir.

Major vegetative changes will occur on 170 acres of the reservoir area with varying amounts of alteration occurring on the remaining 1060 acres. Vegetation will consist of approximately one third grass and brush around the periphery, with the remaining two thirds about equally divided between marsh and open water. Much of the open water of the proposed pool would support submerged aquatic vegetation.

The over-all effects of the North Springfield Reservoir on the white-tailed deer population of the area will be negligible. Some suitable habitat will be lost or partially damaged at lower elevations through establishment of the permanent pools and annual flooding operations. However, reversion of tilled lands to mixed brush and forbs and less human activity throughout the greater part of the area should offset the losses at lower elevations in the site. Similar effects will occur in respect to the transitory bear and boar population of the area.

Clearing for and holding of the permanent pools will destroy some upland-game habitat. In addition periodic inundations will cause some direct destruction of grouse, woodcocks, rabbits and hares if flooding occurs during times when these species are nesting. This direct destruction will be most serious in the lower portions of the site where flooding occurs most often. Benefits will accrue to the upland-game of the site, with the exception of grey squirrels, through improved habitat conditions if land use changes occur at the higher elevations of the site. Total effects of the North Springfield Reservoir will be moderately detrimental to upland-game species of the area.

The terrestrial fur animal of the area, the red fox, will be affected in the same general way that is mentioned above for upland-game animals. Except during times of inundation, muskrats, minks and raccoons should benefit considerably from the permanent pools aspect of the project plan. Stable-level shallow water will be particularly valuable to muskrats and to a lesser extent to minks and raccoons. These species, especially the muskrats, will suffer losses through inundation above permanent pool levels but in the total should benefit from reservoir construction. Beavers and otters will not be particularly benefited by the permanent pools, but will be subject to the detrimental effects of inundation of bottom lands within the site above the permanent pools. Over-all effects of the project will be neutral or slightly beneficial to fur-animal populations of the region.

Waterfowl resources will be benefited materially by construction and operation of the North Springfield Dam and Reservoir as planned. The permanent pools will provide new nesting habitats for black ducks and will provide a good resting and feeding area for migrating waterfowl. Standing water areas of any size are extremely rare in this

region, particularly ponds having any considerable amounts of marsh or shallows capable of producing aquatic plants.

10. Report of Wildlife Agencies. A preliminary report on the fish and wildlife resources in relation to the water development plan for the North Springfield Reservoir Project on the Black River was submitted by the U. S. Fish and Wildlife Service in April 1951 and a draft of a detailed report in March 1957. These reports were prepared in cooperation with the Vermont Fish and Game Service.

The detailed report concluded that "the over-all effects of the project on wildlife resources will be neutral or slightly beneficial."

11. Other Resources. The forestry resource of the project will be evaluated in cooperation with the Department of Agriculture and appropriate State agencies as required by Public Law 86-717-H.R. 9377. Development and management for this purpose will be accomplished to the extent practicable and compatible with the recommended other uses of the project.

An investigation of the historical, prehistorical and archeological significance of the reservoir area was made by personnel of the Peabody Museum of Harvard University under contract with Region Five of the National Park Service. The report was received in January 1959.

This report notes the general region of the North Springfield Reservoir lies near the northwest boundary of the territory of the Pennacook Confederacy. Although references and relics exist of Pennacook, Pocumtuck and Abnaki Indians in the general area, no evidence was found of occupancy by these tribes in the reservoir. The nearest villages were some twenty miles to the east and westerly in the Hudson River and Lake Champlain drainage areas.

Although it is uncertain how early European penetration of this region began, a Dutch map dated 1713 appears to indicate French penetration and missionizing by this date.

Numerous remnants of Indian groups defeated, broken and dispossessed as a result of the various Indian Wars, were filtering northward in Canada through this area in the latter part of the 17th century.

One of the major avenues across the Green Mountains was the Black River Valley and the trail which followed it was known as the Old Indian Road.

The first recorded mention of travel along this way is in the diary of James Coss, who scouted the trail to Lake Champlain for the Massachusetts Government in 1730.

Around 1750 the Old Indian Trail was used in going to Quebec to exchange prisoners with the French and by scouting parties to approach the French strongholds on Lake Champlain.

In 1759 after the fall of Fort Ticonderoga, manpower became available to control the Indians and to build a military road along the trail. Consequently, General Geoffrey Amherst, Commander of the British forces in North America, began what was to become the Crown Point Road.

During the construction of this road, a camp was established near North Branch River in the upper reaches of the reservoir. This was known as "Ten Mile Camp" and a stone marker with the inscription "1759 10M Camp" marked the site.

This marker has been preserved during construction of the project and will be available for posterity to note this road of such great significance in the early years of this country.

The National Park Service advises that the value of salvage excavation for other possible archeological findings is doubtful, but it will consider this point further.

On further advise of the Service, four covered wooden bridges of historic interest, which had to be removed from the reservoir area due to flood control demands, were carefully dismantled and stored. In this manner, these valuable relics of early New England have been preserved for future generations.

No other known historical, archeological, or mineral resources are affected by the project.

IV. FACTORS INFLUENCING RESERVOIR DEVELOPMENT

12. Features of Region Served. Located about 135 miles northwesterly of Boston, 185 miles southerly of Montreal, 105 miles easterly of Albany and 240 miles northerly of New York City, and served by an excellent highway system which is being improved and expanded constantly, this region of Vermont and New Hampshire is a most important factor in helping to satisfy the ever-growing recreational demands of the populous northeast section of the United States and eastern Canada. The beautiful Connecticut River Valley is the centerpiece of a panorama which includes the Green Mountain Range of

Vermont and the White Mountain Range of New Hampshire with imposing peaks and sparkling streams. The Appalachian Trail passes through the region. National Forest Areas have been established in both mountain ranges, Lake Champlain and Lake George in the westerly part of the region and Lake Winnepesaukee and Lake Sunapee in the easterly part of the region. are major attractions. Other features which add to the interest of the general area are Franconia Notch and the Aerial Tramway, the Flume, the Old Man of the Mountain, the Mount Washington Cog Railway, the Calvin Coolidge Homestead and Quechee Gorge.

This is a land of great historical interest. It is the scene of the savage struggles between the English, French and Indians, which so greatly influenced the ultimate destiny of the North American Continent, and later battles of the Revolutionary War. Great names of Early American history and their deeds are still alive in this land - Champlain, Frontenac, Howe, Rogers and his Rangers, Sir Jeffrey Amherst, Montcalm, Wolfe, Ethan Allen and the Green Mountain Boys, Ticonderoga and many others.

All those exert a strong attraction for the vacationist, the hunter and fisherman, and in greatly increasing numbers, the winter sports enthusiast.

Reflecting the importance of recreation to the New England economy, and indicative of the growing demand for recreational opportunities, are figures compiled by the New England Council which showed that vacationists put about 1.1 billion dollars into the New England economy in 1960 and current reports of various type activities indicate a further increase this year. Fishermen and hunters will spend an estimated \$350,000,000 in New England this year, according to an analysis of the U.S. Fish and Wildlife Service. Vermont and New Hampshire are important participants in the above activities. The State of New Hampshire park statistics showed that in 1958 and 1959 2 out of every 3 persons using day-use type parks were non-residents. This is also characteristic of such uses in Vermont.

Although Springfield, the town nearest the North Springfield Reservoir, is an industrial town, most of the communities in the vicinity have an economy which is based to a large degree on tourism.

13. Population. The number of persons residing within an hours drive (40 miles) of the project is estimated at 217,800 by the preliminary 1960 U. S. Census. See Table 1, "Population Data".

The principal communities within a 40-mile radius follow:

<u>Community</u>	<u>Population</u>
Springfield, Vermont	9,900
Rutland, Vermont	18,300
Bellows Falls, Vermont	3,800
White River Junction, Vermont	2,600
Brattleboro, Vermont	9,300
Claremont, New Hampshire	14,000
Newport, New Hampshire	3,200
Lebanon, New Hampshire	9,300
Hanover, New Hampshire	7,300

The balance of the population is contained in small towns and villages.

TABLE I

POPULATION DATA

	<u>Within 10 Miles</u>		<u>Within 25 Miles</u>		<u>Within 40 Miles</u>	
	<u>1960</u>	<u>1950</u>	<u>1960</u>	<u>1950</u>	<u>1960</u>	<u>1950</u>
Vermont	17,750	17,100	46,900	45,100	114,300	112,200
New Hampshire	13,150	12,100	44,000	40,400	103,500	92,300
Total	30,900	29,200	90,900	85,500	217,800	204,500

14. Existing Public Recreation Areas. The two states within the 40-mile zone of influence of the project provide state parks, forests, and other recreation areas for the public. The development of these vary considerable in extent. Plate Number 2 shows the location of existing public recreation areas and available uses. It will be noted that only one Vermont Park provides swimming. The addition of the North Springfield pools to supplement the deficiency of public water areas in the vicinity will be of great value.

15. Interest in Public Use. Strong public interest has been shown for the past decade in recreational use and development of the project area. Newspaper editorials have endorsed such use. Public officials and the people of the area, including hunters and fishermen, have long and vigorously supported this use. The U. S. Fish and Wildlife Service and the Vermont Fish and Game Service recommend fish and wildlife management and public hunting and fishing. The Water Conservation Board of the State of Vermont, with the approval of the Governor, in letter dated 5 August 1960 to the Division Engineer, after due consideration of the many varied, and sometimes divergent views, expressed the interest of the State by a recommendation that the Water Conservation Board be licensed to operate and maintain the reservoir area for uses as proposed in this master plan.

16. Anticipated Public Use. The North Springfield and the North Hartland Reservoirs are only thirty miles apart and it is expected that these two reservoirs will serve a large segment of common areas. The Ball Mountain and Townshend Reservoirs are about an hour's drive south of the North Springfield project and will also serve a portion of the population within a common zone of influence.

The physical characteristics of these reservoirs complement each other for desired public uses. Each possesses distinctive assets which will increase public recreational benefits.

The North Hartland Reservoir includes a gorge of magnificent proportions and attractive groves above spillway crest which are suitable for camping. The Ball Mountain Reservoir offers mountainous scenery, opportunity for isolation and solitude and good hunting and fishing. The Townshend Reservoir is located in a highly scenic part of the West River Valley immediately adjacent to heavily travelled Route 30 and offers an excellent day-use park area.

The recreation land and water resources of the North Springfield Reservoir are those described as intermediate recreation areas in the 1959 publication by "Resources for the Future, Inc." titled "The Crisis on Outdoor Recreation". This recognizes the difference between resource-based recreation areas of outstanding natural qualities and user-oriented recreation areas whose most important characteristic is accessibility. An intermediate recreation area is defined generally as a day-use area relatively easy to reach with boating, swimming, hiking, picnicking and fishing as the most common activities. It has pleasing scenic qualities and can readily be adapted to public recreation use. It has been estimated that the demand for this type area will increase as much as sixteen times by the year 2000. The proposed initial development at the project site is designed to accommodate 38,000 visitor-days use by 1964, allowing room for expansion as later demands may warrant.

The procedure used in estimating annual attendance is based upon the population and population trends within an hour's drive of the project, weighed by the experienced relationship between park visits and population. In Vermont there are 1.15 park visits per capita and ever-growing tourism indicates an increasing ratio of out-of-state visitors.

Consideration is then given to other factors such as accessibility, other public and private facilities, vacation patterns, and experienced use of similar type installations.

The anticipated annual attendance of 38,000 by 1964 was arrived at in cooperation with officials of the State of Vermont and is considered conservative. This visitation estimate represents the use of the area annually by 17% of the population residing within a 40 mile radius of the project.

V. IMPROVEMENTS NEEDED

17. Requirements for Maximum Benefits. Cooperation of Federal, State and local agencies with the Corps of Engineers will be required in order to obtain maximum recreation, conservation and wildlife benefits from the North Springfield Reservoir. Development by the Corps of Engineers will be limited to minimum access, sanitary and picnicking facilities, parking, boat launching ramp, and provisions to make the recreation area safe for public use. It is expected that the provision of these basic facilities will encourage full development, management, maintenance and services by state and/or local agencies. The Water Conservation Board of the State of Vermont has requested a license for management of the recreation area by an appropriate state agency. The issuance of such a license will be recommended subsequent to approval of this Master Plan.

In order to secure maximum wildlife benefits from the project's resources, a general plan will be developed for fish and wildlife management with the U.S. Fish and Wildlife Service and the Fish and State Fish and Game Service of the State of Vermont with a subsequent license to the State Fish and Game Service for management and improvement of project areas for wildlife purposes.

Cooperation of state and local highway agencies will be required in order to continue desirable road access to the project and to erect suitable direction signs to the project.

18. Type of Facilities Required. It is contemplated that Federal expenditures will be limited to the following types of facilities in the reservoir area: access roads, car and boat trailer parking, boat ramp, picnic facilities including picnic tables, fireplaces and trash receptacles, a beach area, change house structure, pit-type toilets and attendant structures, well water with hand pump, and safety measures as required. Adequate signs will be posted for the information, direction, safety and convenience of the visiting public.

Snow will be cleared to provide a skating area during the winter months, and for the parking of cars, to the extent that the demand for such use warrants.

VI. DEVELOPMENT PLAN

19. General. The three areas proposed for initial development have been selected as being suitably located for providing public access and use in the most economical manner, and having the further capability of expansion when and if needed. See Plate 3.

The elevation of the water level of the permanent pool behind the dam was selected primarily to provide winter protection for gate operation for flood control purposes. This provides a water area suitable for public recreational use and also valuable for fish and waterfowl purposes.

The upper pool was created by installation of a conduit through the embankment of relocated Town Road No. 22 at an elevation selected to best utilize the natural features of the valley without significant encroachment on flood control storage.

20. Land Allocation. The tentative allocation of project lands for various purposes is shown on Plate 4.

It is contemplated that the area in the immediate vicinity of the dam will be reserved for operational and maintenance purposes, with accommodations for the visiting public under direct jurisdiction of the Corps.

The Black River Recreation Area and the North Branch Recreation Area will be reserved for day-use public park purposes.

The area at the northeast end of the North Branch Pool will be used for boat launching and boat trailer parking.

The remainder of the project's lands will be allocated for fish and wildlife management, improvement and use. This allocation will also include forestry management, where appropriate. Portions of this area will be made available to the Vermont Army National Guard as a training area for tracked vehicles. These military requirements will be clearly delineated prior to consummation of any agreement with fish and wildlife interests.

Any outgrants of land for individual or non-public purposes will be of a temporary nature, pending final determination that it is excess to public need. With the strong demand for public use, this does not appear likely.

21. Plan of Improvement. The development of facilities by the Corps of Engineers in areas to be later licensed to the state or other agencies will be confined initially to improvements described in this memorandum so that considerable latitude will be allowed the operating agency in its program. The proposed plan of initial improvements follows:

a. Vicinity of Dam. Located in proximity to the heavily travelled U.S. Route 5, the main highway north and south through the Connecticut River Valley between southern New England and Canada, the North Springfield Dam is expected to exert an attraction for the public. An access road, a comfort station, a parking area, and an overlook area have been provided in the prime construction contract for the accommodation of visitors. An information sign with pertinent project data will also be erected at the dam.

b. Black River Recreation Area. This is the area on the lower pool where development is planned for day-use park-type recreation. It is convenient to the Town of Springfield. The proposed improvements consist of the following:

- Access Road
- Parking Area
- Sanitary Facilities
- Well, with hand pump
- Picnic Tables and Fireplaces
- Trash Receptacles
- Fire Barrels
- Beach
- Change House
- Selective Clearing
- Safety Measures
- (Floats at swimming area, etc.)
- Signs, as required

c. North Branch Recreation Area. This site on the west side of the upper pool, about three miles upstream from the dam, provides a highly attractive day-use park-type recreation area. It is convenient to the Town of Wethersfield. This site will have the same provisions as above. In addition, a foot path will be provided between the parking area, picnic area and beach.

d. Boat Launching Area. This site is on the northeast side of the upper pool and has been selected both because of existing access and the location, which will keep boating activities away from the swimming area. This is a prudent safety provision. The proposed improvements consist of the following:

Boat launching ramp
Auto and boat trailer parking
and turn-around
Pit-type latrine
Road improvement

e. General Reservoir Area. Minimum improvement of existing roads and cooperative planning with the State Forestry Department for fire protection and suppression measures will be instituted.

Signs for the guidance and safety of the visiting public will be placed at appropriate locations throughout the reservoir area.

f. Overnight Camping. Some 130 acres of land on the west side of the North Branch Pool are above spillway crest elevation. Because of the location, the Water Conservation Board of Vermont requested that consideration be given to development of a camping area.

The hillside is extremely steep, however, and contains no terraces suitable for such use. Much of the hillside is wooded.

Because of these physical features and limited funds, this requested development is not recommended at this time.

22. Criteria. The extent and types of the recommended basic facilities follows guide-line criteria as established in EM 1130-2-312. These provisions are in general consonance with park criteria of the State of Vermont and the National Park Service.

The authorized project needs for availability of the reservoir for the storage of flood flows at all times required some modification of features in order to eliminate hazards to this operation by providing against flotation.

Signs have been designed to blend with the rustic nature of the area.

23. Schedule of Development. The proposed development is scheduled for construction in the last quarter of Fiscal Year 1961.

Funds contained in the approved project estimate are adequate to accomplish the proposed work.

If additional development should be required at some future date because of inadequacy of facilities due to increases in usage greater than anticipated and inability of the prospective licensee to provide such accommodations then funds will be requested as part of the program for completed projects.

A summary of proposed facilities and estimate of cost are included in Appendix A.

VII. RESERVOIR MANAGEMENT

24. General. Planning for management of the reservoir area for public use has proceeded on the basis of ultimate management by appropriate agencies of the State of Vermont under a long-term license agreement. With the approval of the Governor, the Water Conservation Board of the state has requested such an arrangement. It is contemplated that developed recreation areas will be managed by the Vermont Department of Forests and Parks and the remainder of the reservoir will be managed in the interest of fish and wildlife by the Vermont Fish and Game Service. Management of the forestry resource will be integrated with this activity where compatible.

It must be recognized, however, that several factors may not permit the immediate undertaking of these responsibilities by the state agencies. The method of funding for necessary personnel and maintenance, and the time when funds shall become available have not yet been fully determined.

In order to make the recreational use of the project available to the public during this interim period, this office will manage, operate and maintain roads and other public use facilities subject to the availability of funds for this purpose.

25. Corps Personnel Required. Operating personnel required for this project to perform its authorized mission of flood control is limited to an operator and an assistant. Adequate management of the proposed public use program will require the employment of additional seasonal help. Sanitation demands of non-water-borne toilets may require contract services for proper maintenance. Wells will require sterilization after inundation. Supervision of the developed public use area is required in the interest of orderly and safe use. ~~The reconditioning of facilities will be a necessary annual operation.~~

In consonance with intensity of usage which may be experienced, this office proposes to engage the services of two or three laborers during the months of May to September to perform duties related to the public use program. Proficiency in life-saving techniques will be a requisite for employment.

26. Area to be Managed by Other Agencies. Prior to drafting any license or lease for use of reservoir lands, the proposed detailed program of the agency, including personnel, financial capacity, proposed practices and schedules of development will be reviewed and approved by this office to insure proper management of the resources.

27. General Plan for Fish and Wildlife Management. On the recommendation of the U.S. Fish and Wildlife Service and the Vermont Fish and Game Service a General Plan for Fish and Wildlife Conservation and Management will be prepared for submission to higher authority and subsequent execution. It is contemplated that the Vermont Fish and Game Service will manage and improve the wildlife resources under a long-term license.

28. Other Land Use. Under the existing policy of priority of allocations for land use and the limited value of the reservoir lands for agricultural or grazing uses, it is not contemplated that any private outgrants will be made.

29. Fire Protection. Forest covers about half of the reservoir area. The danger of forest fires is ever present, particularly during dry periods of the year. Public recreational use tends to increase this hazard.

The fire protective and suppression services of the Vermont Department of Forests and Parks and surrounding communities are available for use on lands of this reservoir. Public use of the forest lands will be controlled in conformity to conditions as established by that Department. No open fires will be permitted except at fireplaces in the developed recreation areas. Roads throughout the reservoir will be maintained in a manner adequate to permit passage of fire-fighting equipment. Drums filled with water will be placed throughout the picnic area.

Any supplemental measures recommended by the U.S. Forest Service or the Vermont Forest Agency during the required review of the project forest resources will be instituted.

Public education in the field of forest fire dangers by Federal and State forest services through the medium of signs, press and radio has been quite successful in New England. No forest fires have occurred on reservoir lands in this Division for the past fifteen years.

30. Health Measures. The report of the U.S. Public Health Service, dated January 1956, advises that neither malaria nor mosquito borne encephalities are recognized as public health problems in the area.

Anopheles quadrimaculatus, the malaria mosquito, occurs in southern Vermont, but normally is not common.

Pest mosquitoes of the woodland species and flood water mosquitoes, especially *aedes vexans*, are present in the area.

In consonance with recommendations contained in the report, the following measures have, or will be taken.

a. The reservoir area has been cleared of trees and brush to elevation 467 feet, m.s.l. in the lower pool area and generally to elevation 505 feet, m.s.l. in the area upstream of relocated Town Road No. 22.

b. In order to minimize mosquito problems, flottage, secondary growths and aquatic plants will be removed after impoundments, as necessary.

c. As part of the maintenance program, surveys to determine the amount of mosquito breeding will be made and chemical measures will be provided to control any significant production.

d. The Bureau of Environmental Sanitation of the Vermont State Department of Health will be consulted on desirable remedial measures for any health problems encountered.

e. Analysis of water in the streams for suitability will be performed in areas wherever public swimming is proposed.

f. Well and spring water for public use will be tested before such use, after any inundation and at least annually to insure its safety.

The U.S. Public Health Service concludes that the overall effects of the project should be beneficial from the mosquito control standpoint since a reduction in flooding of downstream areas should result in a decrease of the highly pestiferous *aedes vexans* mosquito.

31. Controls and Regulations. The main objective of controls and regulation at reservoir lands and waters is to provide for the health and safety of the public. Signs should be informative, permissive and inviting. Negative signs and warnings should be held to a minimum. This policy will be followed in administration of the reservoir for public use so that the public may enjoy the greatest freedom without unnecessary restraint.

As a prudent safety procedure, barriers will be installed on all roads leading into the reservoir area so that they may be closed, for the protection of the public, prior to any impoundment of floodwaters. Suitable signs will also be posted.

32. Monumentation. It has not been deemed necessary to monument project boundaries. The nature of the topography does not require delineation on the ground of the limits of recreation areas except for signs. If a forestry management program which involves timber harvesting should be found desirable, the limits of fee-owned land will be marked by blazing or painting trees. It is contemplated that this would be accomplished by the agency licensed to manage this resource.

VIII. CONCLUSIONS AND RECOMMENDATIONS

33. Conclusions. The North Springfield Reservoir, including a permanent pool of 110 acres behind the dam and another 65 acres on the North Branch River, will be an important supplement to existing public recreation areas.

The proposed plan of improvement will utilize to best advantage project lands which are desirable for public access and recreation and those lands which are valuable for wildlife purposes.

The Master Plan, as presented, complies with the Flood Control Act of 1944, as amended, the Coordination Act of 1958, and the Forest Cover Act of 1960 and Engineering Manuals implementing these Acts. It also has the general concurrence of Federal and State agencies who are interested in the development of the reservoir area for maximum public benefit.

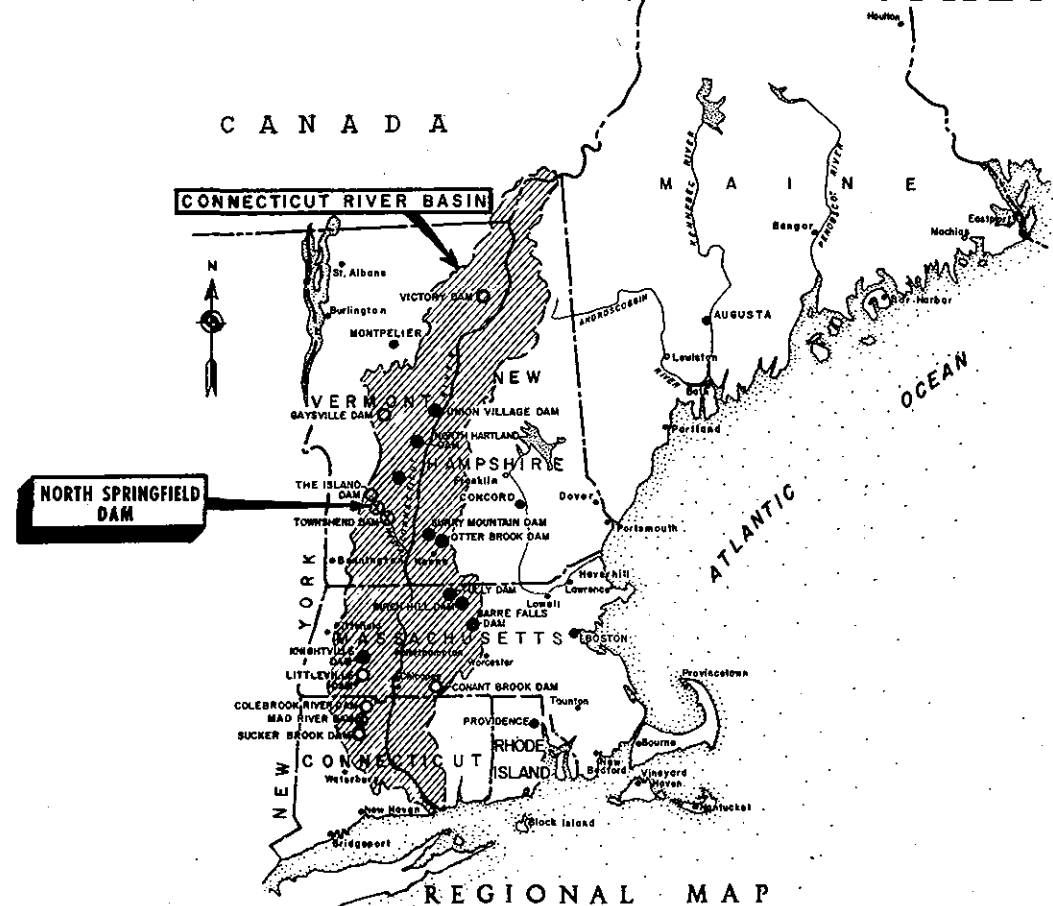
34. Recommendation. It is recommended that this Master Plan for the development of North Springfield Reservoir, Vermont be approved at the earliest practicable date.

CONNECTICUT RIVER FLOOD CONTROL

NORTH SPRINGFIELD RESERVOIR

BLACK RIVER

MASTER PLAN FOR DEVELOPMENT



LEGEND

- RESERVOIRS COMPLETED ●
 RESERVOIRS UNDER CONSTRUCTION ⊙
 RESERVOIRS AUTHORIZED ○

INDEX

SHEET NO.

- 1 REGIONAL MAP & INDEX
- 2 PUBLIC RECREATION AREAS
- 3 GENERAL DEVELOPMENT PLAN
- 4 LAND ALLOCATION MAP
- 5 VICINITY OF DAM
- 6 NORTH BRANCH RECREATION AREA
- 7 BLACK RIVER RECREATION AREA

DRAWING NO.

- CT-1-5683
- CT-1-5684
- CT-1-5685
- CT-1-5686
- CT-1-5687
- CT-1-5688
- CT-1-5689

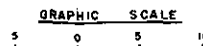
SHEET NO.

- 8 TYPICAL DETAILS
- 9 PIT LATRINE AND CHANGE HOUSE
- 10 PICNIC TABLE-FIREPLACE-DETAILS
- 11 PROJECT INFORMATION SIGN
- 12 PROJECT IDENTIFICATION SIGN
- 13 PROJECT FEATURE SIGN







DRAWING NO.

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- CT-1-5691
- CT-1-5692
- CT-1-5693
- CT-1-5694
- CT-1-5695

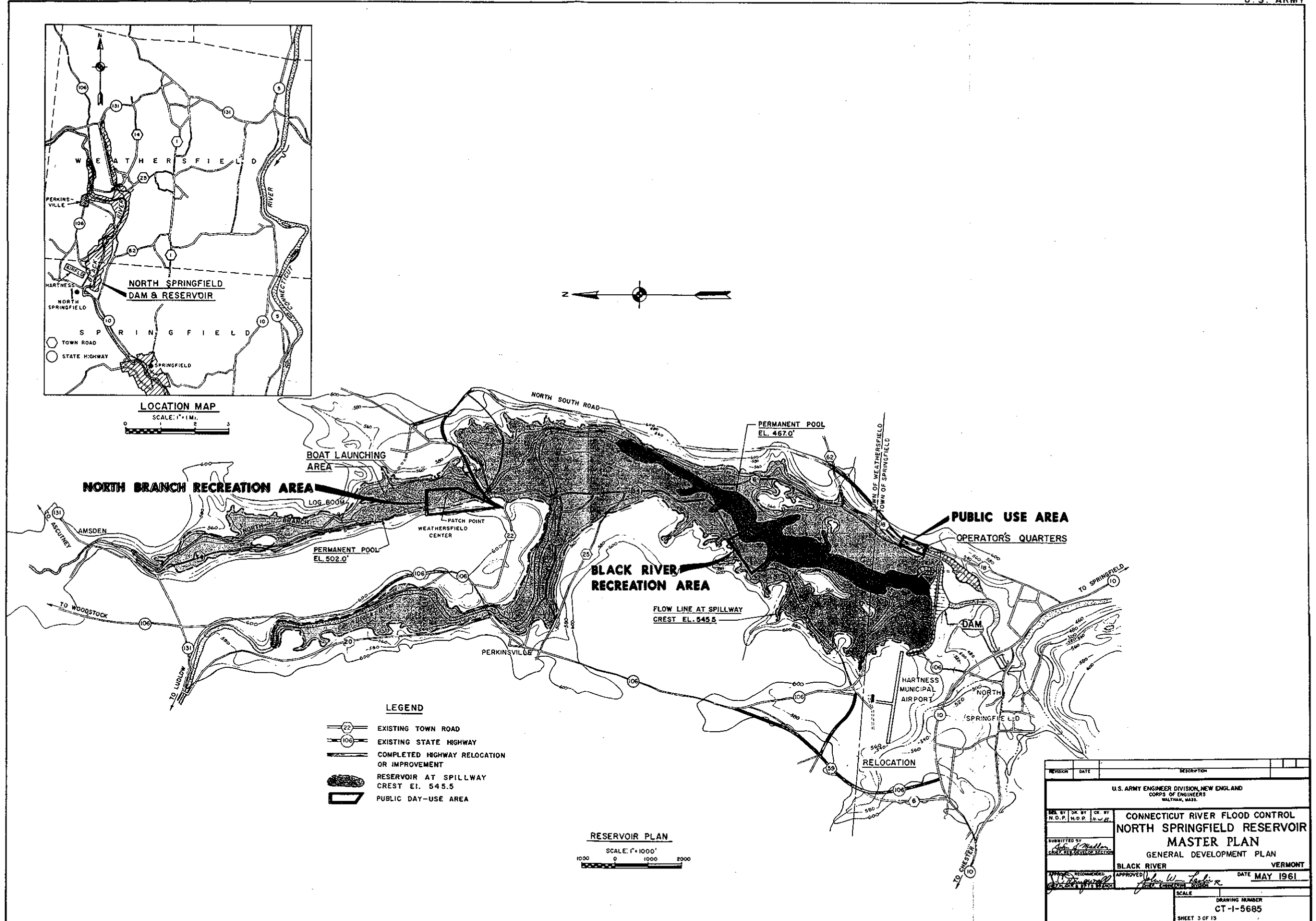
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U. S. ARMY ENGINEER DIVISION, NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.			
DR. BY G. D. R.	TR. BY M. S.	CK. BY M. D. R.	CONNECTICUT RIVER FLOOD CONTROL NORTH SPRINGFIELD RESERVOIR MASTER PLAN REGIONAL MAP & INDEX
SUBMITTED BY John A. Maden CHIEF RES. DEVELOPMENT SECTION			BLACK RIVER VERMONT
APPROVED [Signature] CHIEF ENGINEERING DIV.			DATE MAY 1961
SCALE			DRAWING NUMBER CT-1-5683
SHEET 1 OF 13			

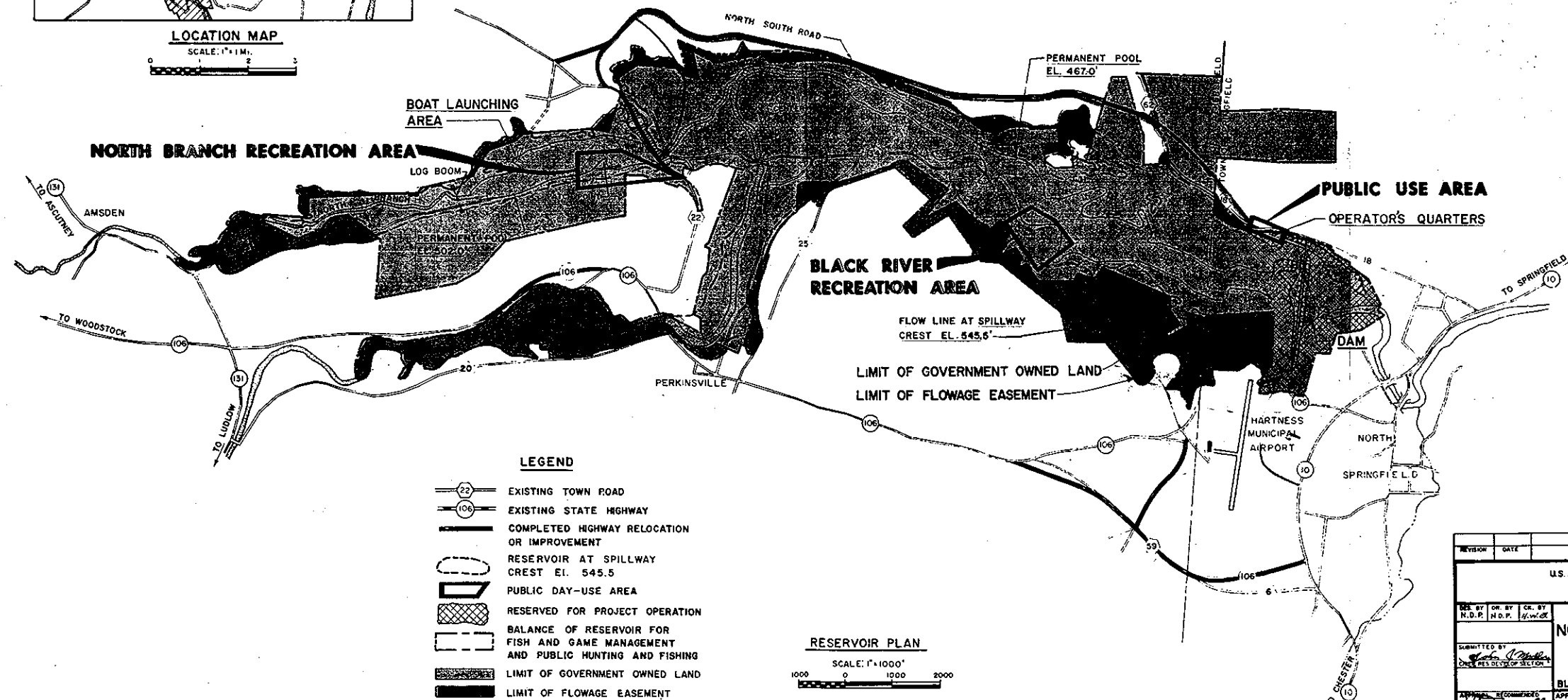
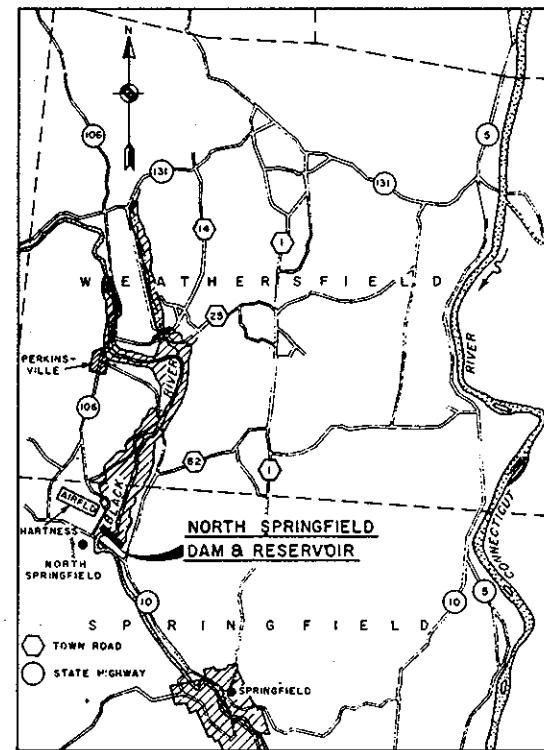


LEGEND

-  — National Forest Developed Areas
-  — State Parks
-  — State Forests
-  — U. S. C. E. Flood Control Dams
-  — State Highway
-  — U. S. Highway

[illegible]

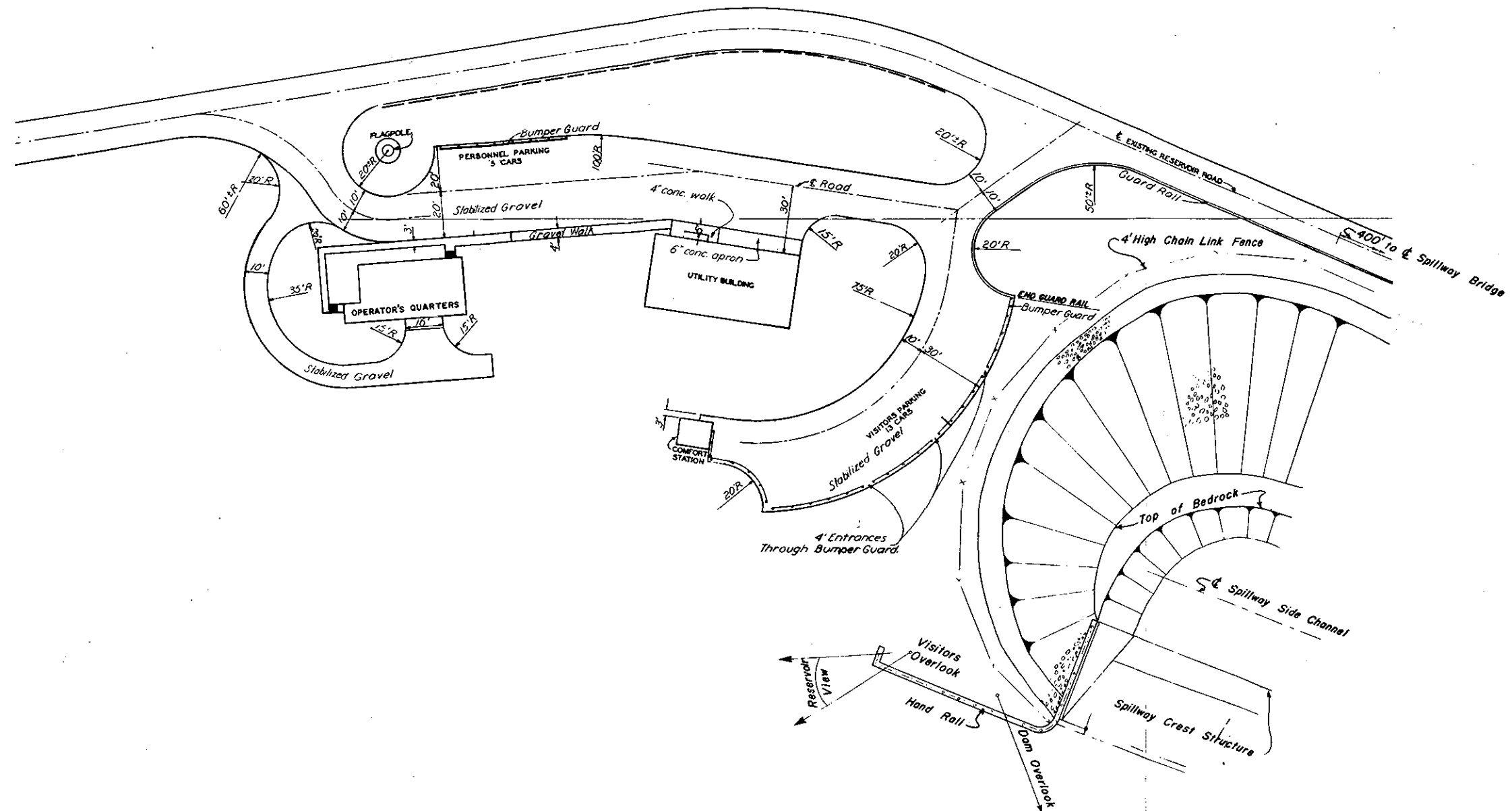




LEGEND

- 22 EXISTING TOWN ROAD
- 106 EXISTING STATE HIGHWAY
- COMPLETED HIGHWAY RELOCATION OR IMPROVEMENT
- RESERVOIR AT SPILLWAY CREST EL. 545.6
- PUBLIC DAY-USE AREA
- RESERVED FOR PROJECT OPERATION
- BALANCE OF RESERVOIR FOR FISH AND GAME MANAGEMENT AND PUBLIC HUNTING AND FISHING
- LIMIT OF GOVERNMENT OWNED LAND
- LIMIT OF FLOWAGE EASEMENT

REVISION	DATE	DESCRIPTION
U.S. ARMY ENGINEER DIVISION, NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.		
CONNECTICUT RIVER FLOOD CONTROL NORTH SPRINGFIELD RESERVOIR MASTER PLAN LAND ALLOCATION		
BLACK RIVER		VERMONT
APPROVED		DATE MAY 1961
SUBMITTED BY		SCALE AS SHOWN
DRAWING NUMBER		
CT-1-5686		
SHEET 4 OF 13		



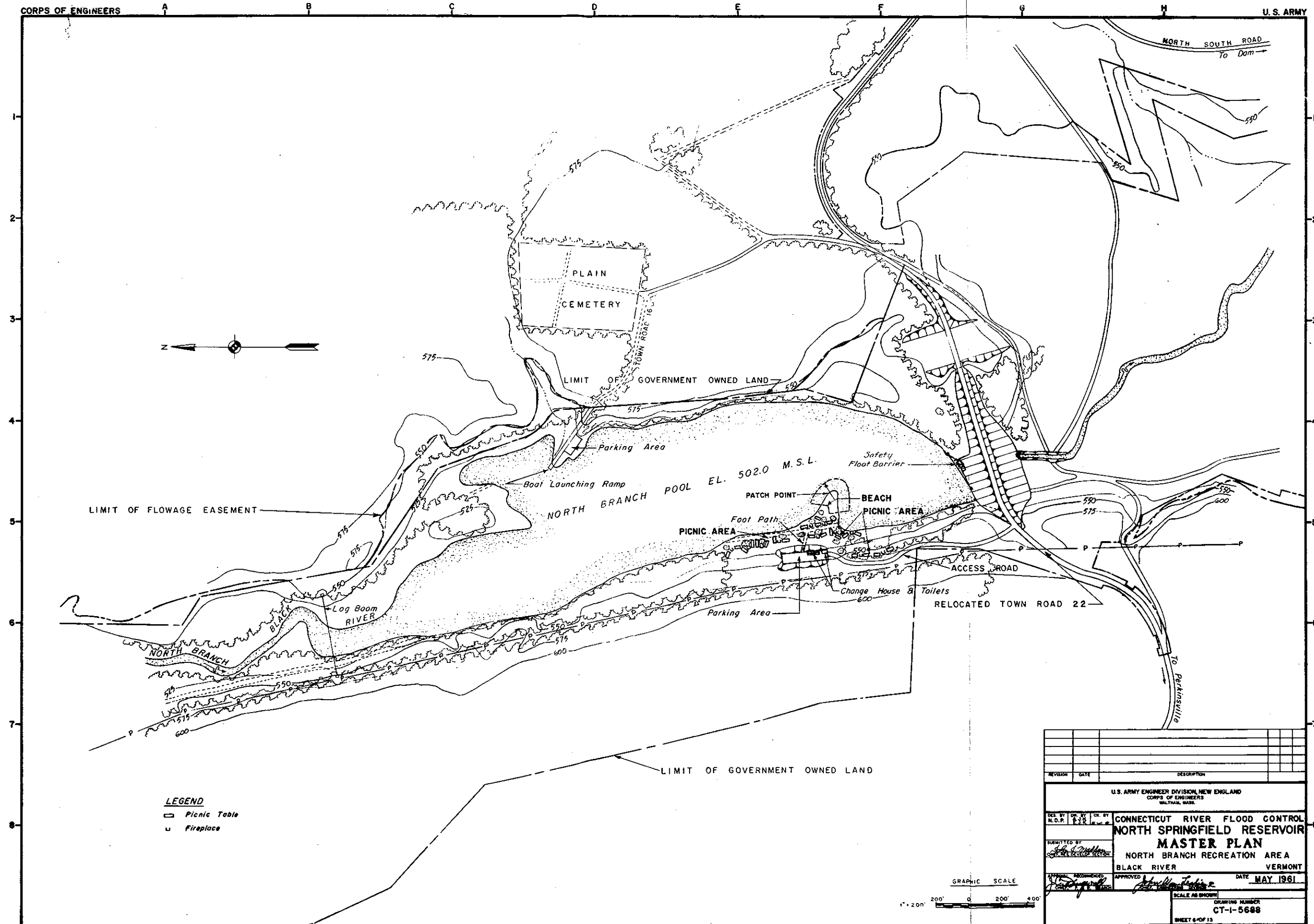
PLAN OF OBSERVATION AREA

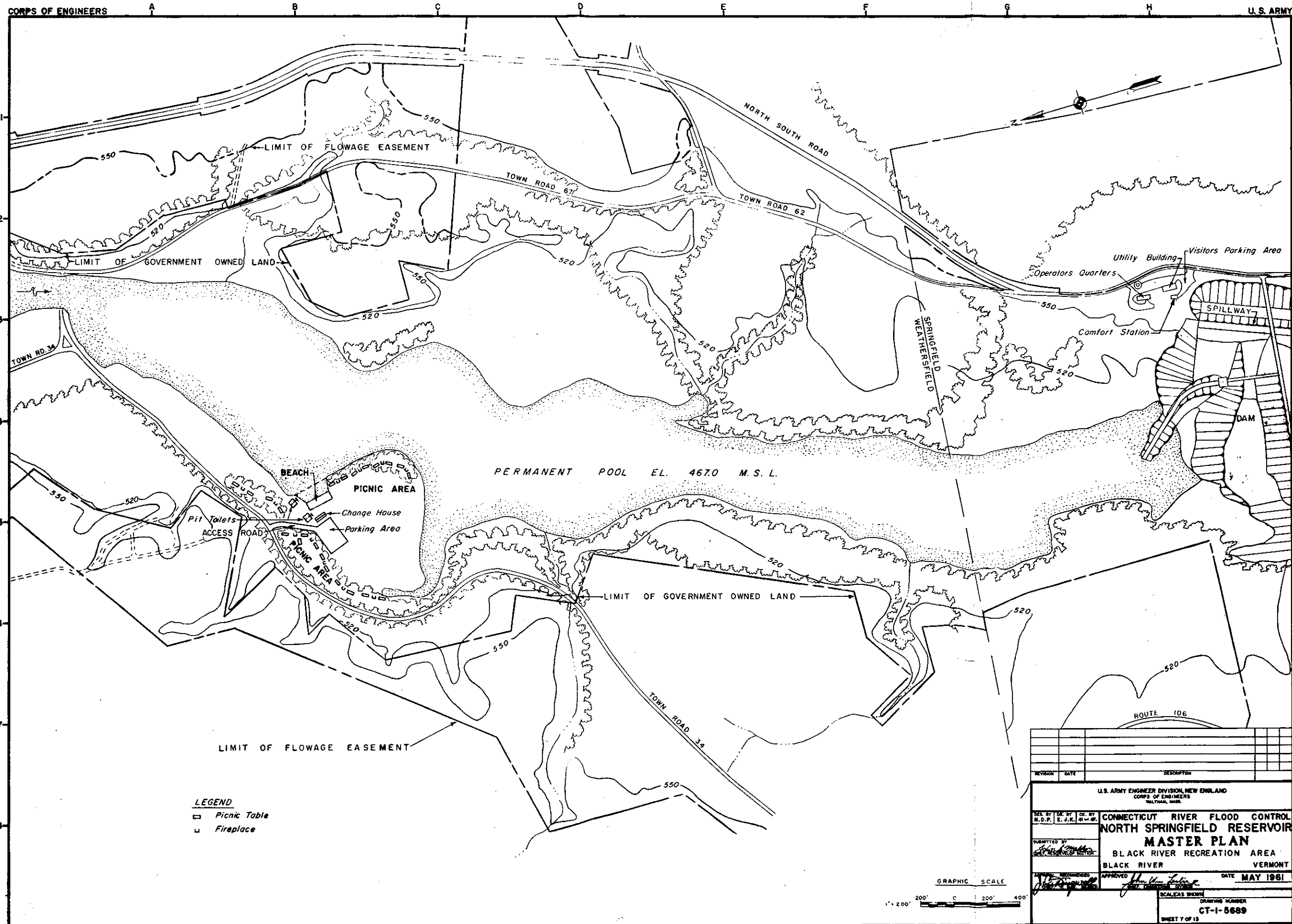
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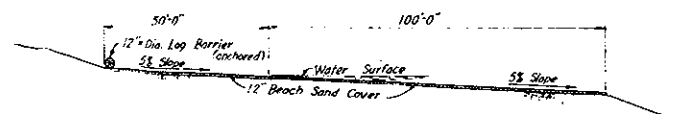
GRAPHIC SCALE

0' 20' 40'

REVISION	DATE	DESCRIPTION	BY
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CONNECTICUT RIVER FLOOD CONTROL NORTH SPRINGFIELD RESERVOIR MASTER PLAN VICINITY OF DAM			
DES. BY N.D.P.		CHK. BY N.D.P.	DATE MAY 1961
SUBMITTED BY [Signature]		APPROVED [Signature]	
BLACK RIVER		VERMONT	
DRAWING NUMBER CT-1-5687		SHEET 5 OF 13	

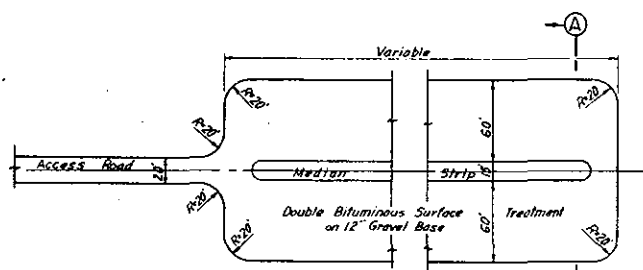




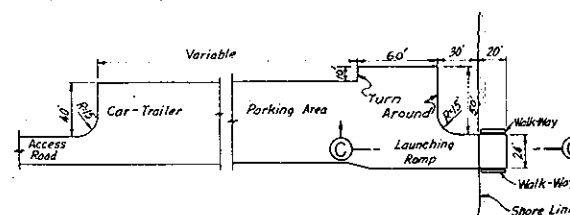


TYPICAL SECTION - ACCESS ROAD

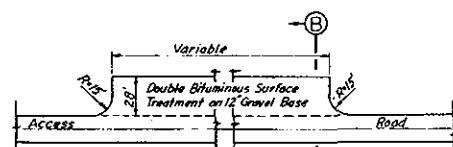
TYPICAL SECTION-BEACH



TYPICAL PLAN - CAR PARKING AREA



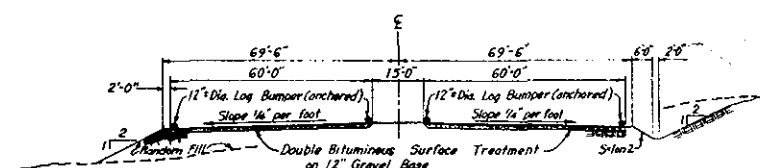
TYPICAL PLAN-BOAT LAUNCHING AREA



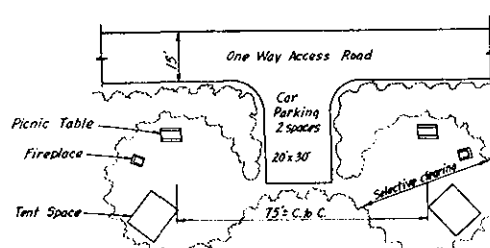
TYPICAL PLAN-CAR PARKING AREA



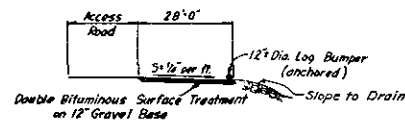
SECTION C-C



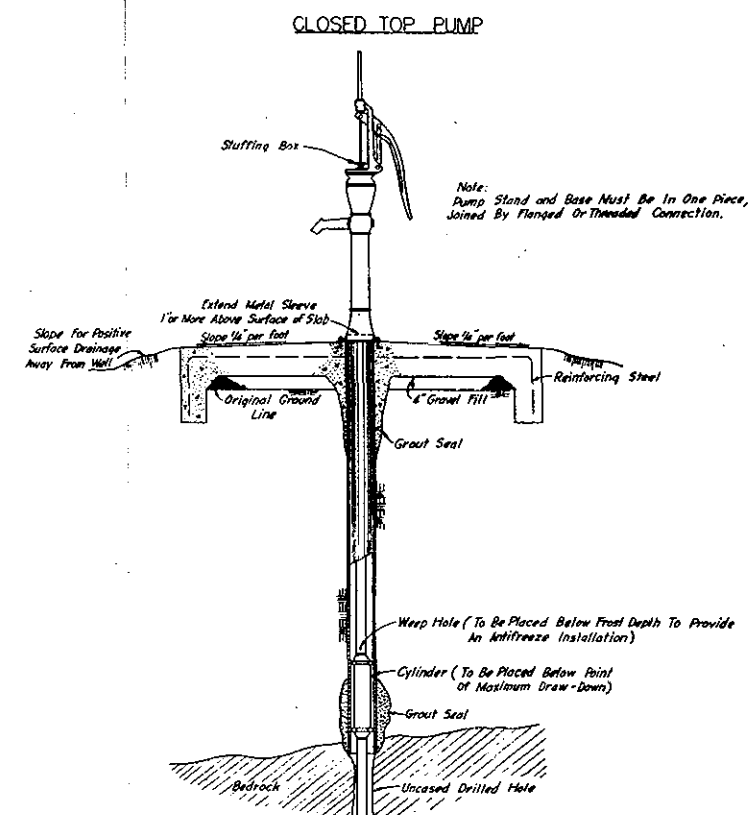
SECTION A-A



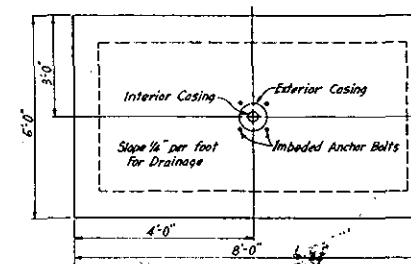
TYPICAL PLAN-CAMPING AREA



SECTION B-B

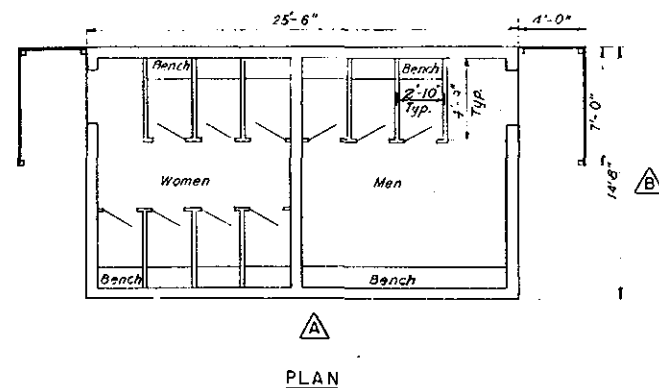


TYPICAL DETAIL - WELL & HAND PUMP

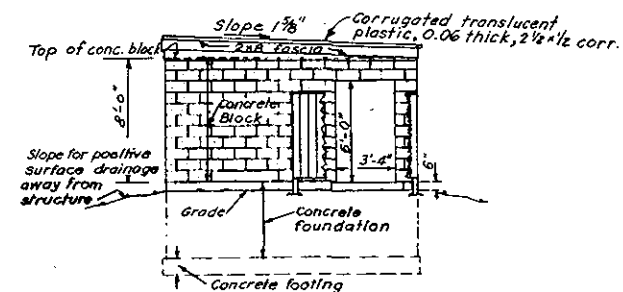
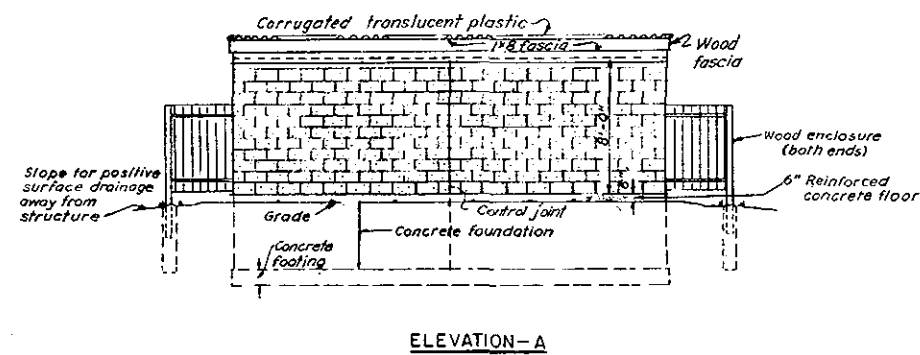


PLAN-CONCRETE PLATFORM

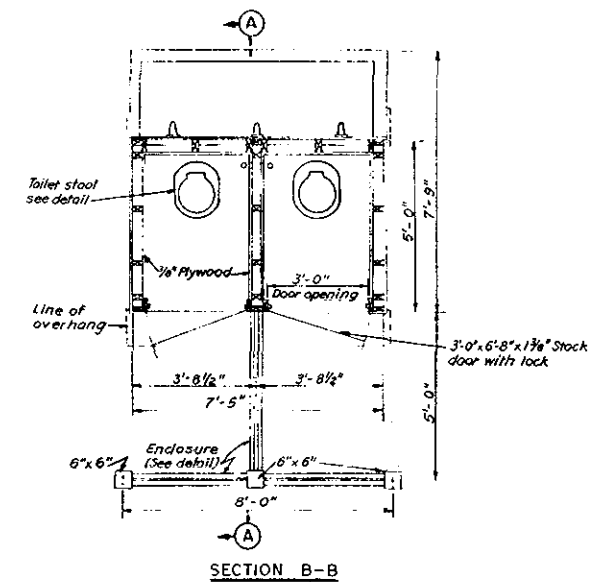
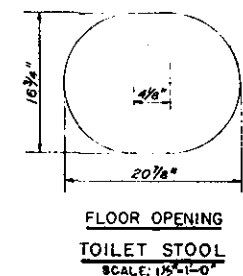
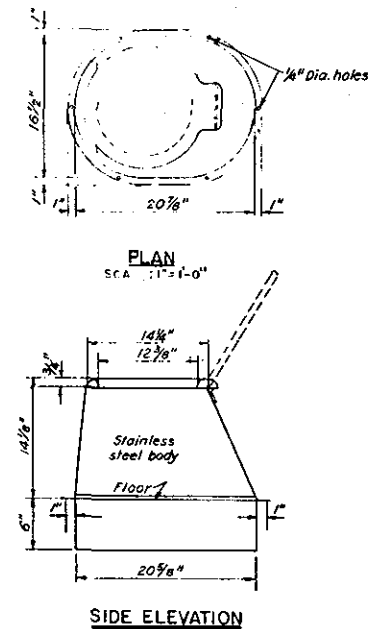
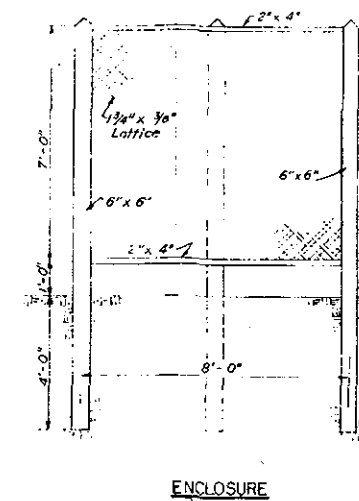
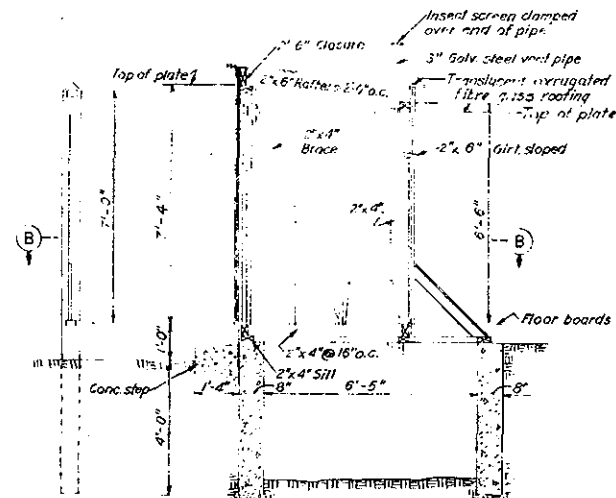
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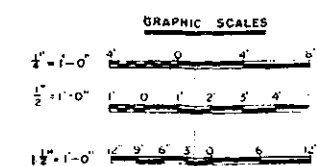
NOTES:
Roofing to be of translucent corrugated plastic.
Floor in both men's and women's side to be sloped towards outer edges of structure to provide for drainage.
Every fourth concrete block in the bottom course, all around, omitted to provide drainage from within.



DETAILS CHANGE HOUSE
SCALE: 1/4" = 1'-0"



DETAIL - PIT LATRINE
SCALE: 1/2" = 1'-0"



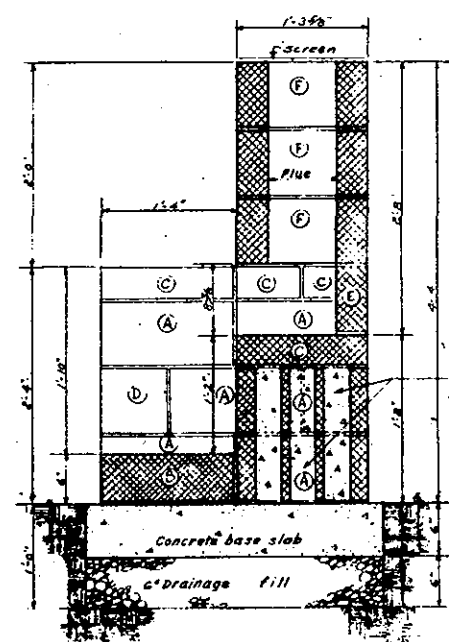
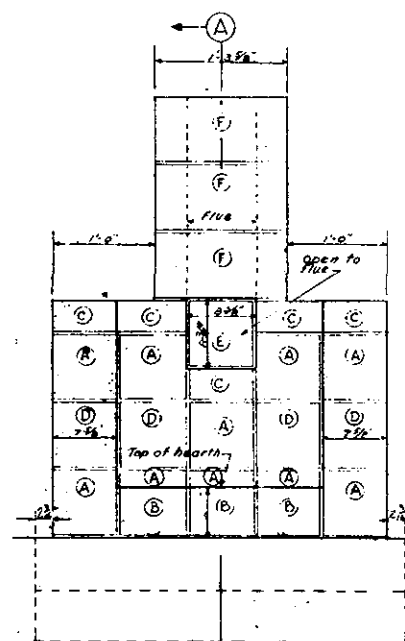
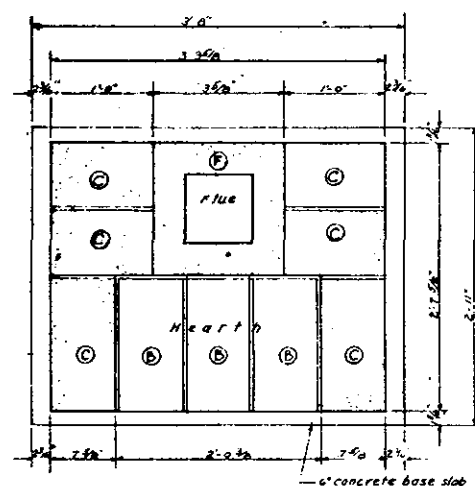
REVISION	DATE	DESCRIPTION

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.

DESIGNED BY: *[Signature]*
CHECKED BY: *[Signature]*
SUBMITTED BY: *[Signature]*

CONNECTICUT RIVER FLOOD CONTROL
NORTH SPRINGFIELD RESERVOIR
MASTER PLAN
PIT LATRINE & CHANGE HOUSE
BLACK RIVER VERMONT
DATE: MAY 1961

APPROVED: *[Signature]*
SCALE: AS SHOWN
DRAWING NUMBER: CT-1-5691
SHEET 9 OF 13



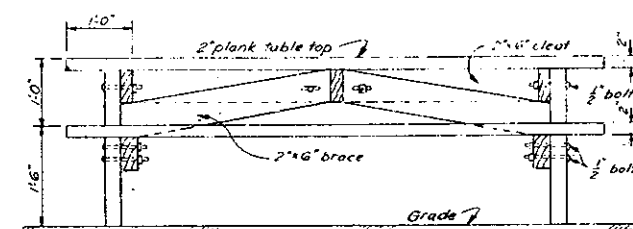
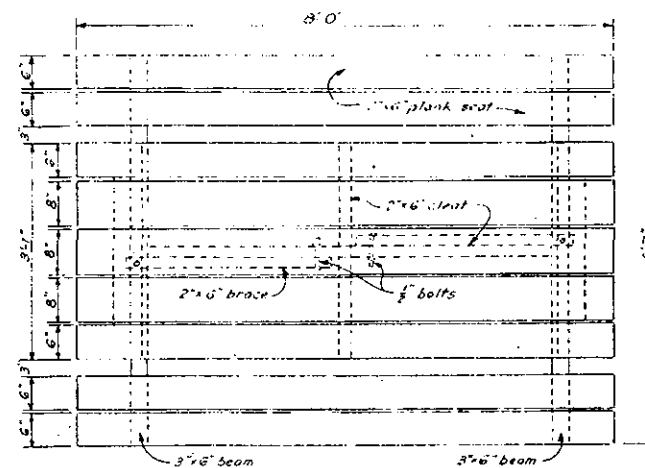
SECTION A-A

DETAIL OF FIREPLACE

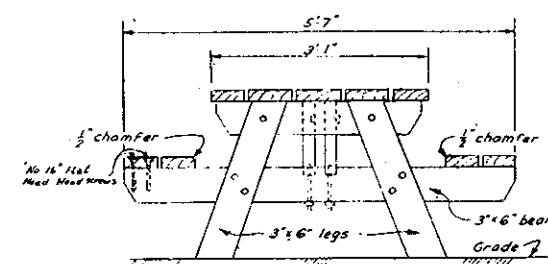
SYN	SIZE	TYPE
A	8 x 8 x 16	Hollow concrete blocks
B	6 x 8 x 16	Solid "
C	4 x 8 x 16	"
D	8 x 8 x 8	Hollow "
E	4 x 8 x 8	Solid " block
F	8 x 16 x 16	Cone chimney blks, are flue

EQUIPMENT REQ'D.

Furnish and install one metal fire box similar to Model OF-38-S as mfg. by Majestic Co. Inc. Huntington, Indiana or approved equal in each of the fire places.

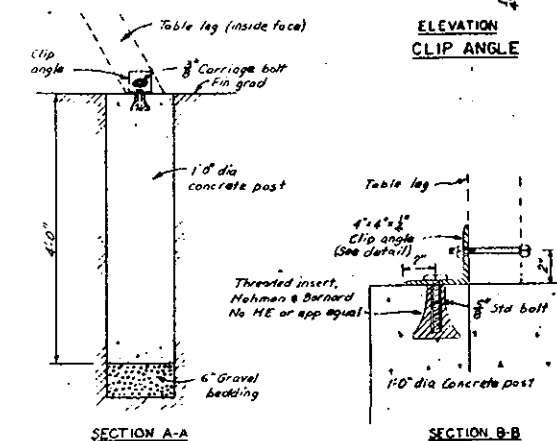
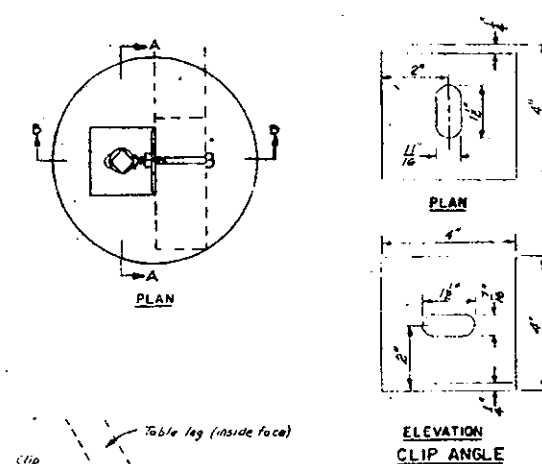


SIDE ELEVATION



END ELEVATION

DETAIL OF 8' PICNIC TABLE



DETAIL OF PICNIC TABLE PIER

REVISION	DATE	DESCRIPTION
U.S. ARMY ENGINEER DIVISION, NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.		
DESIGNED BY H.O.P. (H.O.P.)	CHECKED BY J.M.P. (J.M.P.)	CONNECTICUT RIVER FLOOD CONTROL NORTH SPRINGFIELD RESERVOIR MASTER PLAN PICNIC TABLE - FIREPLACE - DETAILS BLACK RIVER VERMONT DATE MAY 1961
APPROVED BY J.C. (J.C.)	APPROVED BY J.C. (J.C.)	SCALE DRAWING NUMBER CT-1-5692 SHEET 10 OF 15

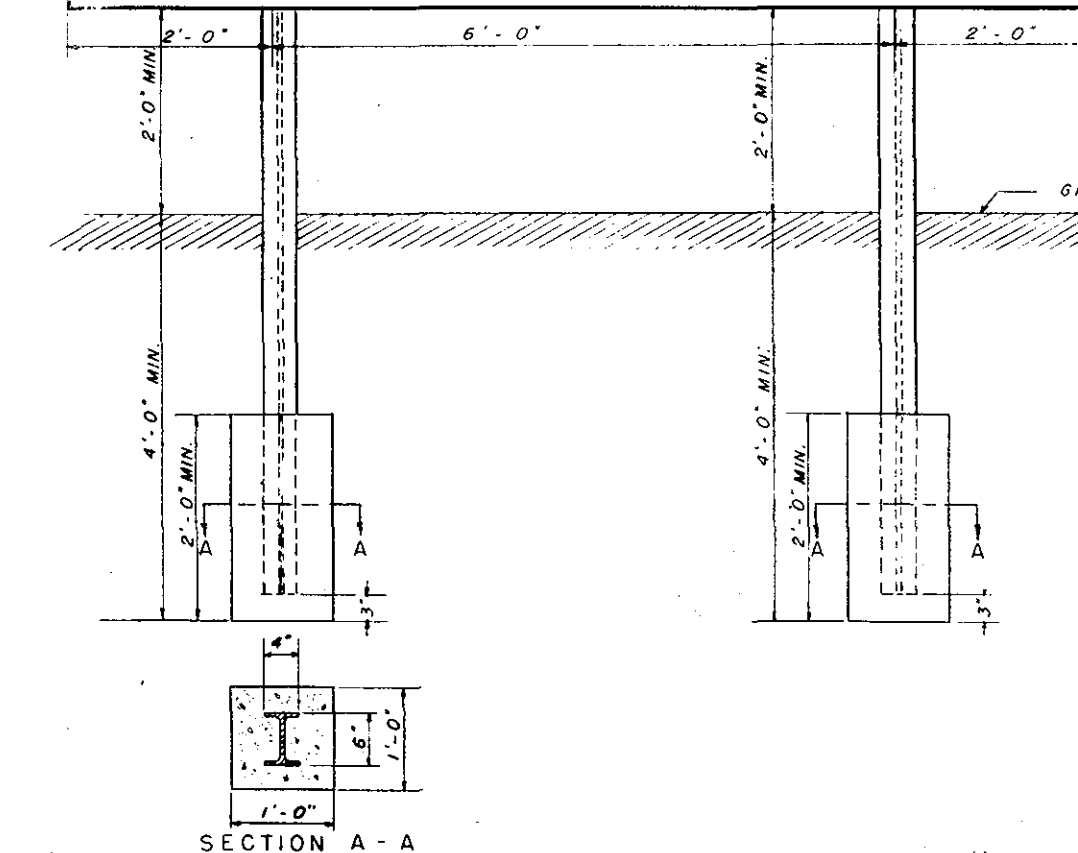
NO. SPRINGFIELD DAM
BLACK RIVER

DESIGNED CONSTRUCTED AND OPERATED BY
U.S. ARMY ENGINEER DIVISION
NEW ENGLAND
 CORPS OF ENGINEERS
 IN COOPERATION WITH
THE STATE OF VERMONT

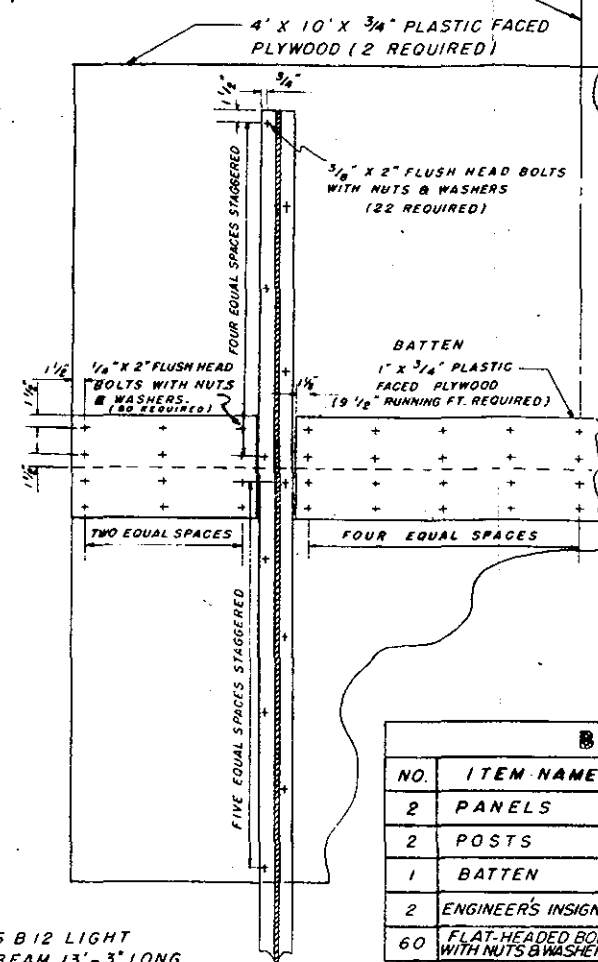
THIS PROJECT IS PART OF THE SYSTEM OF RESERVOIRS AND LOCAL PROTECTION WORKS FOR THE CONTROL OF FLOODWATERS IN THE CONNECTICUT RIVER BASIN. THIS DAM WAS CONSTRUCTED AT A COST OF \$6,580,000 AND WOULD PREVENT \$9,890,000 IN DAMAGES IN A RECURRENCE OF THE FLOOD OF 1936.

	CONSTRUCTED	1957 - 1960	
LENGTH OF DAM	2,940 FT.	LENGTH OF SPILLWAY	384 FT.
HEIGHT OF DAM	120 FT.	ELEVATION SPILLWAY CREST	545.5 FT. M.S.L.
BASE WIDTH	610 FT.	CONCRETE	18,000 C.Y.
TOP WIDTH	30 FT.	AREA OF RESERVOIR	1,260 ACRES
TOTAL EMBANKMENT	1,740,000 C.Y.	DRAINAGE AREA	158 S.M.
ELEVATION TOP OF DAM	570.0 FT. M.S.L.	MAXIMUM CAPACITY	16.5 BILLION GAL. 50,600 ACRE-FT.

REGULATION IS EFFECTED BY THREE 5' X 12' HYDRAULICALLY OPERATED GATES. THIS DAM IS OPERATED FOR THE PROTECTION OF DOWNSTREAM AREAS VERMONT, NEW HAMPSHIRE, MASSACHUSETTS AND CONNECTICUT FROM FLOOD DAMAGE.



SIDE ELEVATION

ENGINEER'S INSIGNIA
(2 REQUIRED)FASTENERS SYMMETRICAL ABOUT C
4' X 10' X 3/4" PLASTIC FACED
PLYWOOD (2 REQUIRED)6 B 12 LIGHT
BEAM 13'-3" LONG
(2 REQUIRED)CAST IN PLACE CONCRETE
BASE (2 REQUIRED)

NOTES:

1. SIGN BOARD PAINTED WITH TWO COATS ENAMEL UNDERCOAT FEDERAL SPEC. NO. T T-E-543 AND ONE COAT SYNTHETIC ENAMEL FEDERAL SPEC. NO. T T-E-489 B.
2. LETTERS AND BORDER PAINTED WITH ONE COAT BLACK PAINT FEDERAL SPEC. NO. T T-P-61B
3. STEEL I BEAMS PAINTED WITH ONE COAT RED LEAD FEDERAL SPEC. NO. T T-P-86 A TYPE 2 AND TWO COATS BLACK PAINT FEDERAL SPEC. NO. T T-B-61-b.

BILL OF MATERIALS

NO.	ITEM NAME	STOCK SIZE	REMARKS
2	PANELS	4' X 10' X 3/4"	PLASTIC FACED WATERPROOF PLYWOOD.
2	POSTS	13'-3" LONG	6 B 12 LIGHT BEAM
1	BATTEN	1' X 3/4" X 10'	PLASTIC FACED WATERPROOF PLYWOOD CUT AS NEEDED.
2	ENGINEER'S INSIGNIA	7" HIGH	MASONITE PAINTED RED & BLACK
60	FLAT-HEADED BOLTS WITH NUTS & WASHERS	1/4" X 2"	
22	FLAT-HEADED BOLTS WITH NUTS & WASHERS	3/8" X 2"	
2	CONCRETE BASES	12" X 12" X 2'	CAST IN PLACE

REVISION	DATE	DESCRIPTION

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND
CORPS OF ENGINEERS
MILITARY BASE

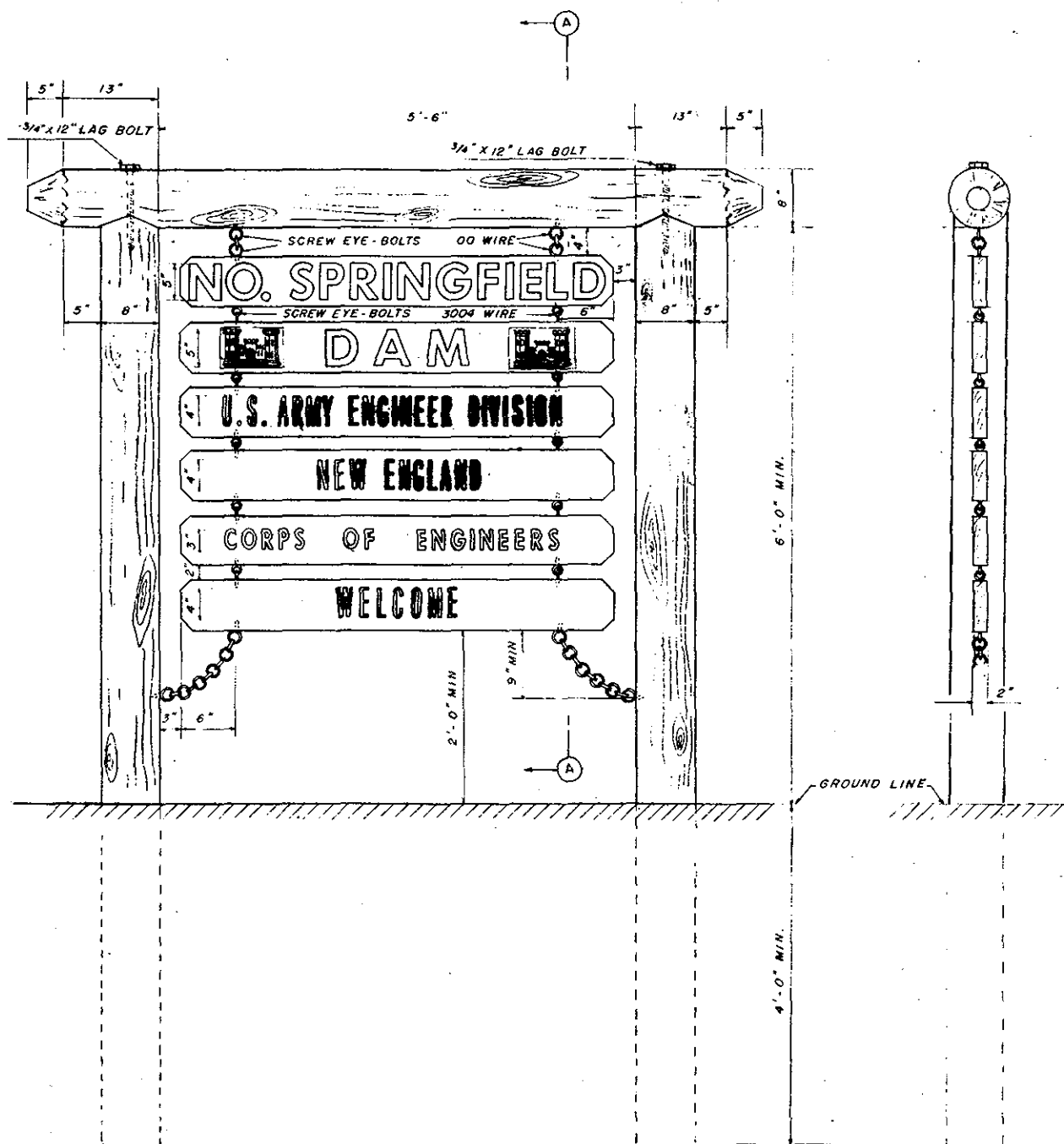
DES. BY: *[Signature]* OR. BY: *[Signature]* CE. BY: *[Signature]*
N.D.P. N.D.P. N.D.P.

SUBMITTED BY: *[Signature]*
CHIEF, CIVIL ENGINEERING SECTION

APPROVED: *[Signature]* DATE: MAY 1961

SCALE: *[Signature]*

DRAWING NUMBER: CT-I-5693
SHEET 11 OF 13



PROJECT IDENTIFICATION SIGN

SCALE 1 1/2" = 1'-0"

SECTION A-A

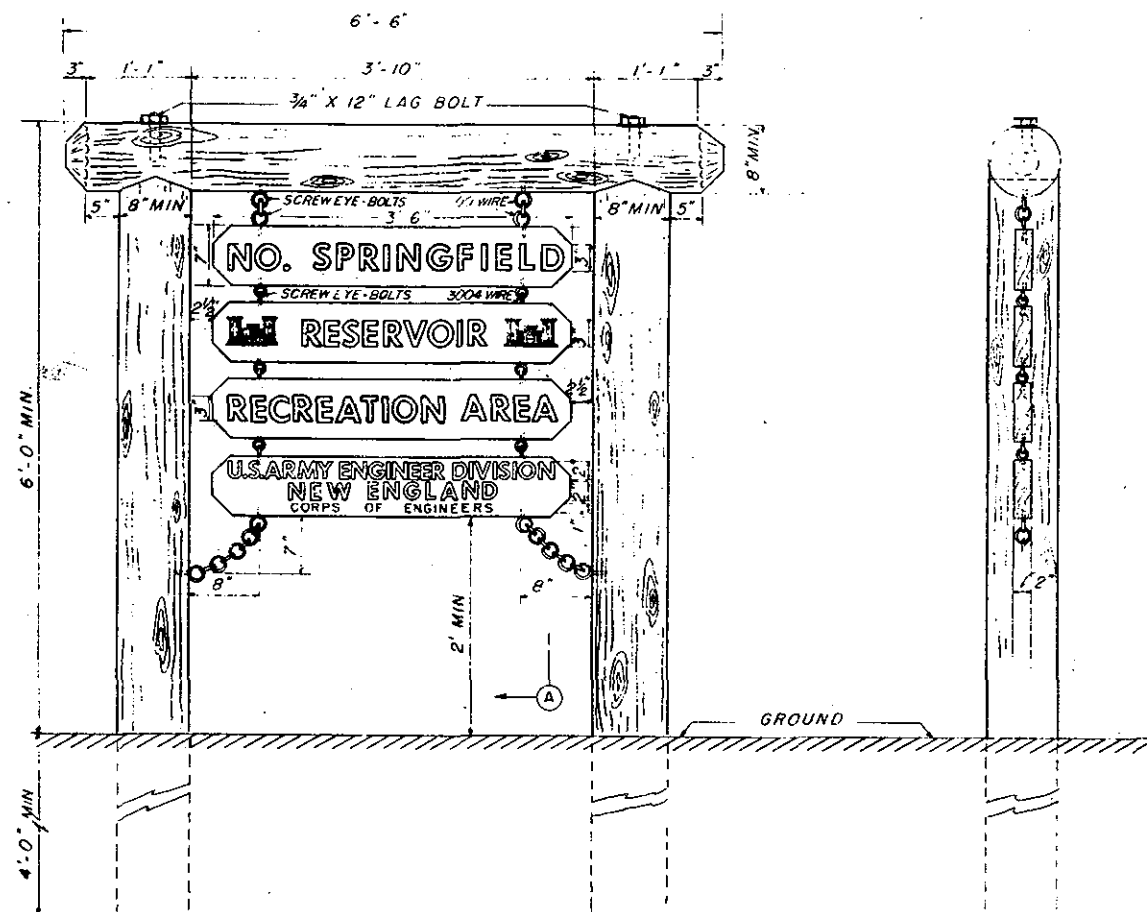
BILL OF MATERIALS			
NO.	ITEM NAME	STOCK SIZE	REMARKS
2	POST'S	8" X 10'-0"	NATIVE LOGS PEELED, PRESSURE-TREATED AND PAINTED OR STAINED
1	BEAM	8" X 8'-6"	PRESSURE TREATED AND STAINED
6	BOARDS	2" X 7" X 5'-0"	GALVANIZED
24	SCREW EYE BOLTS	3004 WIRE	(Length as needed)
4	SCREW EYE BOLTS	00 WIRE	
2	CHAINS	3004 WIRE	
2	LOG BOLTS	3/4" X 12"	
4	ENGINEER CASTLE INSIGNIA	5" CASTLE	RED ON WHITE MASONITE

NOTES:

1. ALL LETTERS TO BE ROUTED AND PAINTED WITH WHITE LUMINOUS PAINT ON BOTH SIDES OF SIGN.
2. ALL METAL TO BE GALVANIZED.
3. ALL WOOD TO BE PRESSURE-TREATED AND PAINTED OR STAINED DARK BROWN.
4. POSTS AND BEAMS TO BE NOTCHED TO FIT AS INDICATED IN DRAWINGS.
5. ALL EYE-BOLTS TO BE CLOSED AFTER ASSEMBLY.

REVISION		DATE	DESCRIPTION	BY
U.S. ARMY ENGINEER DIVISION, NEW ENGLAND CORPS OF ENGINEERS MILITARY DISTRICT				
DES. BY N.D.P.	OR. BY N.D.P.	CR. BY N.D.P.	CONNECTICUT RIVER FLOOD CONTROL NO. SPRINGFIELD RESERVOIR MASTER PLAN PROJECT IDENTIFICATION SIGN BLACK RIVER VERMONT DATE MAY 1961	
SUBMITTED BY John C. Sullivan DIST. ENGINEER		APPROVED BY John W. Sullivan DIST. ENGINEER		
SCALE		DRAWING NUMBER CT-I-5694 SHEET 12 OF 13		

BILL OF MATERIALS			
NO	ITEM NAME	STOCK SIZE	REMARKS
1	POST	8"Ø X 11'-6"	NATIVE LOGS PEELED, PRESSURE-TREATED AND PAINTED OR STAINED
AS NEEDED	SIGN	2" X 7" X 3'-3"	PRESSURE TREATED AND STAINED
AS NEEDED	BOLTS	1/4" X 12" WITH NUTS & WASHERS	GALVANIZED



FEATURE IDENTIFICATION SIGN

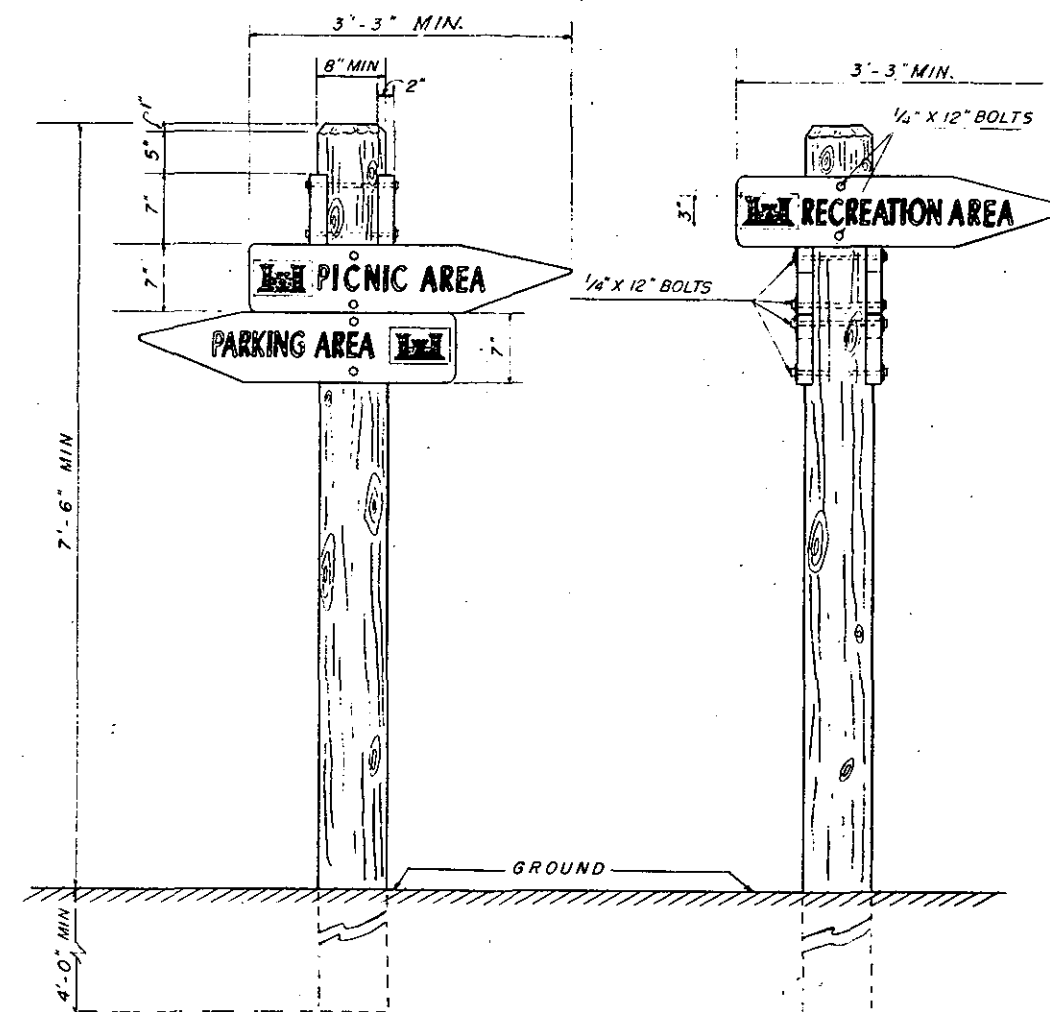
SCALE: 1/2" = 1'-0"

BILL OF MATERIALS			
NO.	ITEM NAME	STOCK SIZE	REMARKS
2	POST'S	8"Ø X 9'-2"	NATIVE LOGS PEELED, PRESSURE-TREATED AND PAINTED OR STAINED
1	BEAM	8"Ø X 6'-6"	TREATED AND PAINTED OR STAINED
16	SCREW EYE BOLTS	3004 WIRE	GALVANIZED
4	SCREW EYE BOLTS	00 WIRE	"
2	CHAINS	3004 WIRE	(Length as needed)
2	LAG BOLTS	3/4" X 12"	"

SECTION A-A

NOTES:

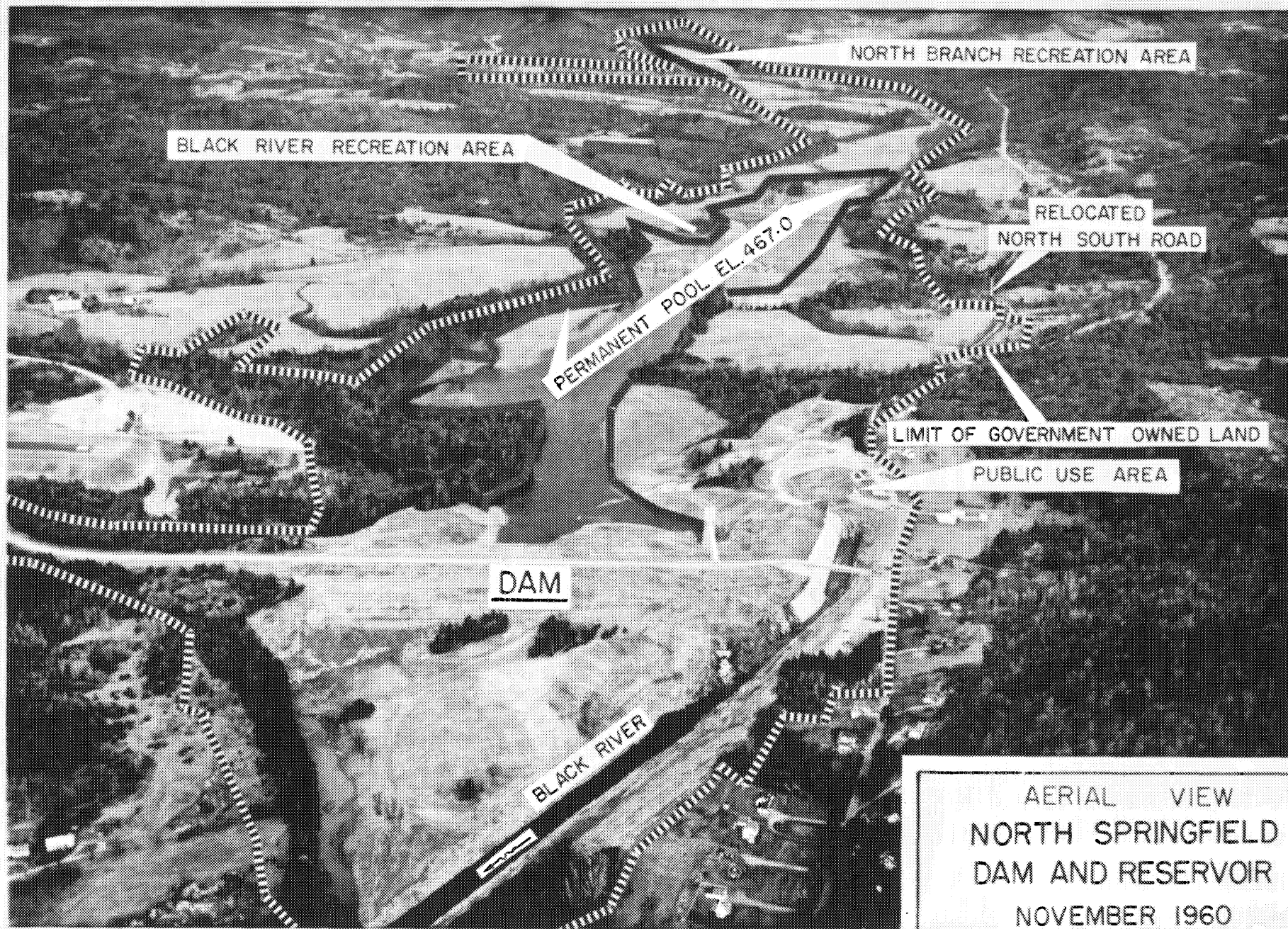
1. ALL LETTERS TO BE ROUTED AND PAINTED WITH WHITE LUMINOUS PAINT ON BOTH SIDES OF FEATURE IDENTIFICATION SIGN.
2. ALL METAL TO BE GALVANIZED.
3. ALL WOOD TO BE PRESSURE-TREATED AND PAINTED OR STAINED DARK BROWN.
4. POSTS AND BEAMS TO BE NOTCHED TO FIT AS INDICATED IN DRAWINGS.
5. ALL EYE-BOLTS TO BE CLOSED AFTER ASSEMBLY.
6. DIRECTIONAL SIGNS TO BE USED TO GIVE DIRECTION TO SUCH OTHER FEATURES AS OVERLOOK PARKING AREA OR PICNIC AREA, TO BE LOCATED AND LABELED AS REQUIRED.
7. ENGINEER CASTLE INSIGNIA TO BE BRANDED INTO WOOD AND PAINTED RED ON WHITE BACKGROUND.



DIRECTIONAL SIGNS

SCALE: 1/2" = 1'-0"

U.S. ARMY ENGINEER DIVISION, NEW ENGLAND CORPS OF ENGINEERS WATERWAYS DIVISION			
CONNECTICUT RIVER FLOOD CONTROL NO. SPRINGFIELD RESERVOIR MASTER PLAN PROJECT FEATURE SIGNS			
BLACK RIVER		VERMONT	
DATE MAY 1961		DATE	
SCALE		DRAWING NUMBER	
CT-1-5695		SHEET 13 OF 13	



AERIAL VIEW
NORTH SPRINGFIELD
DAM AND RESERVOIR
NOVEMBER 1960

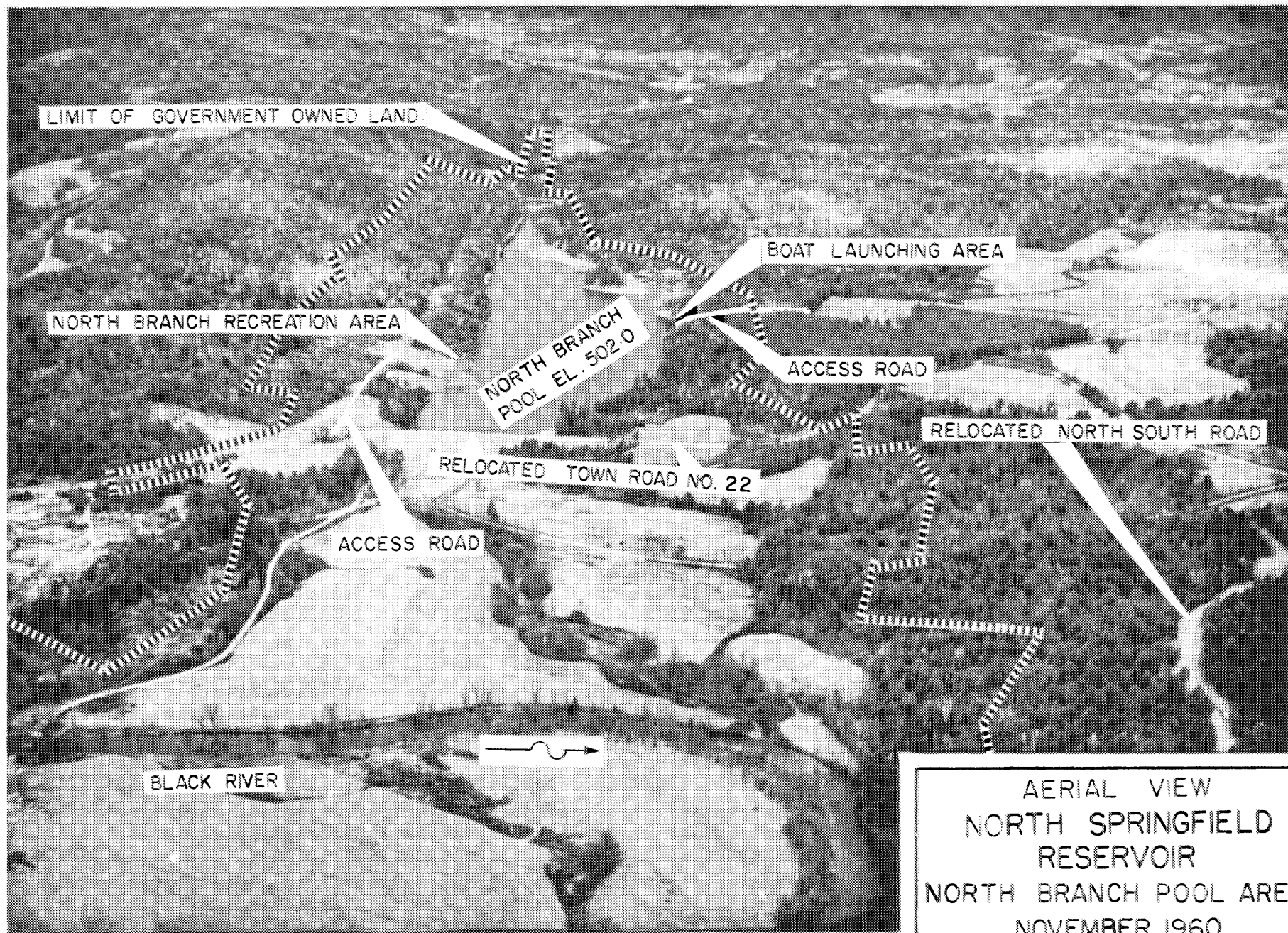
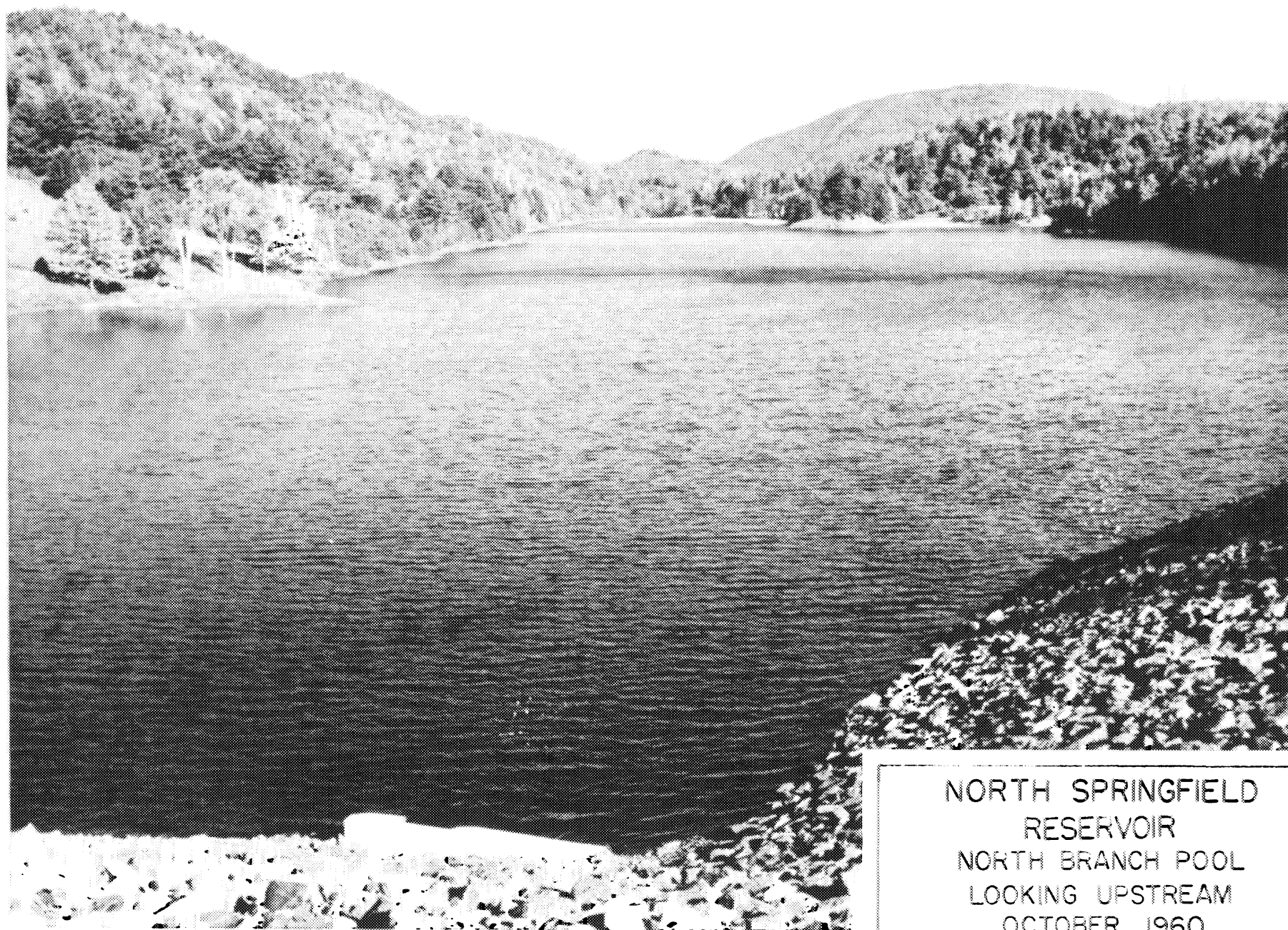
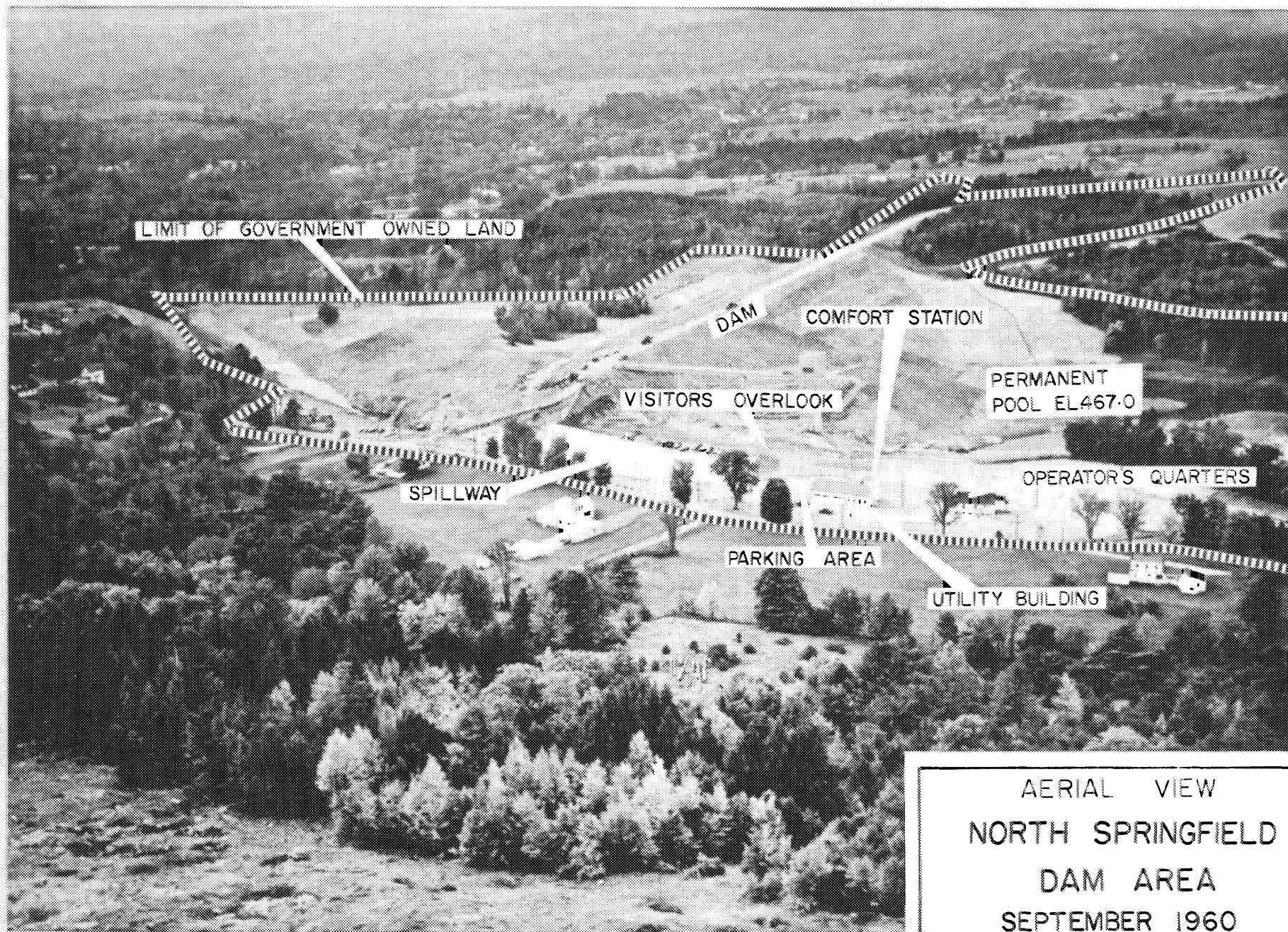


PHOTO NO.3



NORTH SPRINGFIELD
RESERVOIR
NORTH BRANCH POOL
LOOKING UPSTREAM
OCTOBER 1960



AERIAL VIEW
NORTH SPRINGFIELD
DAM AREA
SEPTEMBER 1960

APPENDIX A

ESTIMATE OF COSTS

APPENDIX A

ESTIMATE OF COST

Black River Recreation Area

<u>Item</u>	<u>Unit Price</u>	<u>Quantity</u>	<u>Cost</u>
Access Road, new	\$1,200.00	Job	\$1,200
Parking Area	1.65	2400 s.y.	3,960
Beach Area	2.80	2242 s.y.	6,280
Preparation - Picnic Site	500.00	Job	500
Picnic Tables - anchored	80.00	26 ea.	2,080
Fireplaces	100.00	13 ea.	1,300
Fire Barrels	9.00	13 ea.	120
Trash Receptacles	9.00	13 ea.	120
Drinking Water	1,000.00	Job	1,000
Change House	2,000.00	1 ea.	2,000
Pit Toilets	1,800.00	2 ea.	3,600
Signs	200.00	Job	200
Total			\$22,360

North Branch Recreation Area

Access Road	2.88	2980 s.y.	\$ 8,580
Guard Rail	2.25	350 l.f.	790
Culverts	12.25	100 l.f.	1,225
Parking Area	3.88	1413 s.y.	5,480
Beach Area	.80	2520 c.y.	2,015
Preparation - Picnic Site	500.00	Job	500
Picnic Tables - anchored	80.00	24 ea.	1,920
Fireplaces	100.00	12 ea.	1,200
Trash Receptacles	9.00	12 ea.	110
Fire Barrels	9.00	12 ea.	110
Drinking Water	1,000.00	Job	1,000
Change House	2,000.00	1 ea.	2,000
Pit Toilets	1,800.00	2 ea.	3,600
Signs	200.00	Job	200
Total			\$28,730

Boat Launching Area

Road Improvement	5.00	50 l.f.	\$ 250
Parking Area and Launching Ramp	1.77	1012 s.y.	1,788
Culvert	12.25	50 l.f.	612
Pit Toilet	1,800.00	1 ea.	1,800

Signs	100.00	Job	\$ <u>100</u>
Total			\$ 4,550
<u>Vicinity of Dam</u>			
Signs	100.00	Job	\$ 100
<u>General Reservoir Area</u>			
Signs	260.00	Job	260

SUMMARY OF COST

Black River Recreation Area	\$22,360
North Branch Recreation Area	28,730
Boat Launching Area	4,550
Vicinity of Dam	100
General Reservoir Area	<u>260</u>
Total Construction Cost (Incl. Contingencies)	\$56,000
Engineering and Design (10%)	\$ 5,600
Supervision and Administration (8%)	<u>4,400</u>
Total Cost	\$66,000

APPENDIX B

COMMENTS OF STATE OF VERMONT

FREDERICK G. MEHLMAN. CHAIRMAN
MONTPELIER
PERRY H. BASCOM
STER DEPOT
DOUGLAS B. KITCHELL
BARNET

REINHOLD W. THIEME
COMMISSIONER OF WATER RESOURCES



STATE OF VERMONT
WATER CONSERVATION BOARD
MONTPELIER

August 5, 1960

Alden K. Sibley
Brigadier General, U. S. Army
Division Engineer
424 Trapelo Road
Waltham 54, Mass.

Re: Recreation Developments at
Flood Control Developments
N.E.D. projects in Vermont

Dear General Sibley:

I have been working closely with your Mr. Madden on the recreation facilities that Vermont would like to see developed in conjunction with the four flood control structures now being built. We have had numerous conferences and meetings to air various problems that must be overcome to allow the facilities to become a working part of our state and locally operated recreation projects. Naturally, such developments have many hurdles and obstacles to overcome.

In an effort to consolidate the many varied, and sometimes divergent views, our staff prepared a report on the proposed recreation facilities at the North Hartland, North Springfield, Townshend and Ball Mountain Flood Control Dams. This report was primarily prepared for the consideration of our Board, who the Governor felt, should coordinate and eventually lease from federal interests these developments. This report has been carefully considered by our Board and found to be a reasonable program for State adoption. A copy of this report was given to Mr. Madden to serve as a guide in his activities in this area of development.

Mr. Madden has expressed the desire that this report be officially recognized as the State plan. Accordingly, I do hereby submit a copy of this report as the basis for these developments. You will note that this plan has the endorsement of His Excellency, Robert T. Stafford, Governor of Vermont.

Sincerely,

R. W. Thieme
Commissioner

Plan Approval

[Signature]
Governor, State of Vermont

RWT:ms

STAFF REPORT ON PROPOSED RECREATION
FACILITIES AT THE NORTH HARTLAND,
NORTH SPRINGFIELD, TOWNSHEND AND
BALL MOUNTAIN FLOOD CONTROL DAMS

Recreation has become one of the State's leading industries and there continues to be an ever growing demand for recreational opportunities and facilities. Although the state has a greatly expanded program in park development and park service, the attendance at many of these facilities has increased at such a rate that many of the accommodations are overcrowded. Camping continues to grow at a phenomenal rate and the number of campers has been constantly increasing in the state ever since the state parks were open to this form of recreation. It is also found that record attendance and over-crowding has been most noticeable at the state facility that has any type of water for an attraction.

Fishermen and hunters will find a great attraction to these areas as well as persons seeking recreation in other forms.

The staff feels that recreational developments at the flood control dams could in part compensate the local people as well as the state for the real estate taken out of the economy by reason of federal ownership.

All park-type developments should be in keeping with present Department of Forests and Parks policies and should tie in with the overall program of state parks.

NORTH SPRINGFIELD DAM

On February 9, 1960 the Water Conservation Board called a public meeting at Springfield to inform the public of the recreational possibilities in the flood control area and to obtain the views of the public as to what they would like for the area. There were approximately 90 people present and these people informed the Board as to what they would like in the way of facilities. Since this meeting various organizations have had their own meetings and we have received their views on the subject. We have also received letters and suggestions from various state departments and other interested persons. A tabulation of the various petitions and letters follows:

1. Letter from Fish & Game Service in support of parking area and boat launching ramp for both pools, improvement of Snide Brook for trout, improvement of low-lying areas for waterfowl management, and of the whole area for fishing and hunting.

2. Letter from General Billado, Adjutant, Inspector and Quartermaster General for Vermont, requesting training area for tracked vehicles.

3. Letter from Springfield Chamber of Commerce showing interest in any recreational development possible in the area.

4. Letter suggesting location for access road to upper pool.

The staff has viewed the beautiful impoundment erected by the Corps in the construction of the town road across the reservoir area and we feel that all who worked to obtain this picturesque body of water should be highly commended. The two permanent pools, as well as providing a great recreational advantage to the area, will provide a vastly improved scenic attraction to the ever increasing tourist business.

The staff has considered all the data presented to the Board and does now recommend that the Board request insofar as possible that the Corps of Engineers carry out the following program for the North Springfield Dam and Reservoir Area.

1. A permanent pool at approximately 467' elevation be maintained year-round behind the Flood Control Dam.

2. That the pool formed by the town road crossing on the North Branch be maintained as at present.

3. That an access road be constructed and maintained leading from the top of the dam on the west side of the North Branch Pool down to "Patch Point," so-called.

4. That an access be constructed and maintained on the east side of the North Branch Pool leading from the cemetery to the Stoughton place and a boat launching site and parking area be constructed near the site of the old covered bridge in that area.

5. That a parking area, boat launching ramp, and picnic area with facilities and bathing beach be constructed at or near Patch Point on the North Branch Pool.

6. That an access road parking area, bathing beach, picnic area and attendant facilities be constructed on the lower pool on the F. H. Knapp property.

7. That the low lying areas such as tracts C 301, C 308, C 310 and C 326 be considered for use by the Fish & Game Service for wild fowl propagation.

8. That the brook leading through the Snide property be considered for improvement for trout fishing.

9. That part of the government property, possibly parts of Snide and War properties, be set aside for National Guard use if it will not interfere with other recreational uses.

10. That all roads in the area that are no longer of use for automobiles, be reserved for walking, bicycles, and horseback riding.

The staff in its investigation of the area has just become aware that there is some 140 acres of federally owned land above the 550' contour on the Patch and Stoughton property overlooking the North Branch recreation pool. For this reason, we would recommend that a park type development consisting of access roads, picnic area, camping area, bath house and other related facilities be considered for this area.

NORTH HARTLAND DAM

On January 20, 1960 the Water Conservation Board called a public meeting at White River Junction to inform the public of the recreational possibilities in the flood control area and to obtain the views of the public as to what they would desire. There were approximately 60 people present and the views of these people were obtained. Since the meeting, various groups and organizations have had meetings and we have received their views on the subject. We have also received letters and suggestions from various state departments and other interested persons. A tabulation of the various petitions, letters and interests follows:

1. 720 names (signatures) on petition worded:

"We, the undersigned, appreciate this opportunity to make a recommendation with respect to the development of the area resulting from the construction of the North Hartland Dam.

We firmly believe that a State Park complete with all recreational facilities, around the Gorge area and including the Mill Pond, would be a tremendous asset to this community and to the State of Vermont.

We further believe that as much Federal funds as is presently available should be used for this purpose. "

(Note: This petition was originated by the Recreation Committee of the Town of Hartford, Senator Carl B. Kelton, Chairman)

2. Correspondence has been received from the State Fish and Game Service and the Federal Fish & Wildlife Service in which they have indicated the desire on the part of the Vermont agency to utilize the Quechee Mill Pond and the area downstream from Quechee Gorge to implement the propagation of fish life and waterfowl. Correspondence from Mr. George W. Davis, Director, Vermont Fish and Game Service, states that while it is desirable on their part to utilize the Mill Pond for this purpose, it is recognized that a conflict of interest may exist. For this reason, they would relinquish this area in favor of the lower area if required. Mr. Davis has indicated that his Service would participate in the development on a cost-sharing basis if this is necessary to bring the plan to fruition.

3. Correspondence from the Veterans of Foreign Wars at both local and state level, requests that a memorial consisting of a flag pole and row of set-out maple trees be allowed. This could be done by this organization without state or federal funds if an area were set aside for such a purpose.

4. The Child Study Group of White River Junction, in addition to supporting the general plan as advanced by the Corps, requested that consideration be given to winter facilities. Also, they requested that sections of the proposed state park be fenced off and set aside for the use of children under six years of age. This would conflict with the general purpose of a state park and the type of development which the Corps is authorized by law to provide.

5. A number of organizations (3) and individuals in the Town of Hartland have requested that either a new swimming area be provided in the lower pool or that their old pool below Route 5 (which was ilted in by construction operation at the dam) be dredged out.

6. All correspondence which was received in support of the plan for development which the Corps has proposed. There has been no written opposition. A breakdown of correspondence shows that in addition to Senator Kelton's petition, letters were received as follows:

In support of State Park	15
In support of Wildlife Sanctuary	3
Requesting a War Memorial	3
Requesting swimming in lower pool or cleaning old pool	2
General support of project	2

Having considered all the data presented, the staff does now recommend that the Board request the Corps of Engineers insofar as possible to carry out the following program for the North Hartland Dam and Reservoir Area:

1. That the recreational development as proposed in the Corps of Engineers booklet of November 1959 be implemented in cooperation with the State of Vermont.

2. That a small dam be placed across the river at the upper end of the operation pool to flow the low-lying meadows for wild fowl propagation. This dam should provide for water level manipulation.

3. That any and all areas not used for other recreational purposes be considered for management by the Vermont Fish and Game Service for fishing and hunting.

4. That the beach at Deweys Mills pond be so constructed that a slight variation in water level for water fowl management may be obtained.

TOWNSHEND AND BALL MOUNTAIN DAMS

On March 15, 1960 the Water Conservation Board called a public meeting at Townshend to inform the public of the recreational possibilities in the flood control area and to obtain the views of the public as to what they would like. There were approximately 240 people present. We have received letters and suggestions from various state departments, organizations and interested persons. A tabulation of the various petitions and letters follows:

1. 560 names (signatures) on petition worded:

"We, the undersigned, residents and/or property owners of Vermont, do petition the Commissioner of Water Resources of the State of Vermont to request the U.S. Army Corps of Engineers to include in the plans for the construction of Ball Mountain Dam and Reservoir the following: the construction of a series of weirs to provide fishing pools in the Ball Mountain Dam area.

2. 40 names (signatures) on petition worded:

"We, the undersigned, residents of Jamaica, Vermont, hereby petition the Water Conservation Commission, State of Vermont as follows:

Whereas the United States Government, in accordance with the New England Flood Control Pact, has contracted for the construction of one Ball Mountain Flood Control Dam in the Town of Jamaica, and

Whereas, the construction of the Ball Mountain Dam, alone, will afford no direct benefit to the residents of Jamaica, and

Whereas, the residents of Jamaica have been advised that the United States Government will consider incorporating in the above-mentioned Ball Mountain Flood Dam construction, the creation of one or more permanent water areas, above the Dam for sport and recreation.

We, therefore, call upon the Vermont Water Conservation Commission to use its good offices without delay to the end that such sport and recreation areas be planned for and provided during the construction of the Ball Mountain Flood Control Dam, for the public use and good.

3. Fourteen letters in support of the construction of the weirs in the Ball Mountain Reservoir area.

4. Three letters signed by selectmen of Jamaica, Londonderry and Townshend in support of weirs.

5. One letter in support of improvement of fishing in general.

6. Three letters in support of the general recreational improvement for the reservoir area.

7. Two letters in support of construction of picnic, parking, swimming beach and boating for the area.

8. One letter signed by twenty-one other plus four other letters in support of regulation of flow from Ball Mountain Dam to benefit white water canoeing.

The staff has considered all the data presented and does now recommend that the Board request the Corps of Engineers insofar as possible to carry out the following program:

TOWNSHEND DAM

1. That a permanent pool be maintained at the dam.

2. That an access road, picnic, parking and swimming area be provided on the west side of the pool.

3. That boat ramps be provided to the pool on the East and West sides of the pool.

4. That the old Route #30 be maintained as an access to the pool.

5. That a parking, picnic area and lookout be provided off the new Route 30 where excess material was placed.

6. That a road be provided to the Townshend State Park from the West side of the dam.

7. That all areas not used for recreational purposes be considered for management by the Vermont Fish and Game Service for fishing and hunting.

The staff in reviewing the properties that the Federal government will acquire find that there is approximately 300 acres above the flow line of the reservoir on the Ragle, Reed and Lind properties overlooking the operation pool. We would recommend that a park type development consisting of access roads, picnic area, camping area, bath house and other related facilities be considered for this area. This park could be operated in conjunction with the Townshend State Park just a short distance downstream.

BALL MOUNTAIN DAM

1. That a permanent pool be maintained at the dam.
2. That a picnic area with parking be provided on the access road leading to the top of the dam.
3. That a picnic area with parking be provided in the vicinity of Winhall River.
4. That two fishing weirs be provided, one at the old railroad bridge near the mouth of Winhall River and one at the construction bridge upstream from the dam.
5. That a system for regulated flow be worked out for the white water canoeing.
6. That any and all areas not used for other recreational purposes be considered for management by the Vermont Fish and Game Service for fishing and hunting.

For all four flood control dams we recommend:

1. That all other properties now owned by the government or that will be purchased by the government and which may be declared excess and not needed for flood control purposes not be sold by the government until a further study can be made by the state for possible use in the overall recreational program for the area.
2. That the Water Conservation Board be the agency that would be licensed to operate and maintain the area and they in turn would sub-license the various parts of the area dependent on the facilities provided and the use intended.

3. That as the area of all the recreation or operation pools is limited, and as it is estimated that the pools will be heavily used for swimming as well as fishing, it is felt that water skiing should be excluded from the pools.